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Kansas Entomological Society
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A REVISION OF THREE GENERA OF DELPHACINE FULGORIDS FROM AMERICA NORTH OF MEXICO

(Homoptera-Fulgoridae-Delphacinae)

L. W. MORGAN and R. H. BEAMER

(Continued from July issue)

15. Pissonotus (Pissonotus) 4-pustulatus (Van Duzee)

Stobaera 4-pustulata Van Duzee, E. P., Bull. Buff. Soc. Nat. Sci., 9, p. 200, 1909.
Pissonotus variegatus Spooner, Canadian Ent., 44, p. 235, 1912.
Pissonotus foveatus Spooner, Canadian Ent., 44, p. 234, 1912.

"Brachypterous form: Pale yellowish testaceous, obscurely varied with darker, marked with a broken black band which crosses the base of the clypeus and sides of the pleural pieces, and with two black pustules on either side of the fourth tergal segment. Length: male 2½; female 3 mm.

"Vertex broader and more quadrate with the carinae weaker than in **tricarinata.** Front long ovate, broader than in **tricarinata,** regularly narrowed at base and apex. Antennae but moderately flattened, almost as in **Liburnia.** Pronotum short, carinae rather weak, the lateral almost attaining the hind margin. Elytra reaching the first tergal segment, arcuated at apex. This segment with two polished, blunt tubercles on either side placed lengthwise of the segment and near the margin. Pygofers of the male deeply excavated below and showing on either side a longitudinal ridge above the base of the stiles. These stiles slender, sinuated and but little divergent.

"Color pale yellowish testaceous, obscurely varied or maculated with a darker shade on the abdomen and marked with black as follows; a spot on the cheeks below the eyes, a band on the tumid base of the clypeus which is continued along either side as a row of large blotches on the pleural pieces, a dot or broken line on the front of the first antennal joint and a heavier line behind, a spot near the apex of the femora and another on the base of the tibiae, the stiles of the male and the oviduct of the female, and the four polished tubercles on the fourth tergal segment. Elytral nervures dotted with fuscous. Eyes brown. Front with a few dark dots or marks above but not transversely brown at base as in **tricarinata.**

"Described from one male and nine female examples, all brachypterous, taken at Estero. This species is somewhat anomalous in any genus. It has the frontal characters and general aspect of **Stobaera** while in the characters of the antennae and pronotal carinae it is intermediate between that genus and **Liburnia.** Genus **Stobaera** seems to have been redescribed as **Gonolcium** by Fowler in the Biologia. His **G. granulosum** is perhaps the same as **Stobaera concinna** Stal."

Genitalia: In lateral view pygofer of male more or less triangular with a shallow excavation in caudal margin; aedeagus widest at base, sides more or less parallel, gently curving ventrally, with about four, retrorse, slender processes of different lengths on dorsal margin of outer third; anal segment with a pair of processes quite wide at base and about half as long

as segment. In ventral view styles widest at outer third, apices rounded, overhanging, curved out; median processes stout at base, slightly diverging, outer margin curved to meet inner in sharp point, about two-thirds as long as styles; lateral processes barely noticeable as rounded knobs.

Material studied: Numerous specimens from the following localities: **Florida,** Tampa, Lower Matecomba Key, Cedar Keys, Key West, La Belle, Yankeetown, Punta Gorda, Homestead, Daytona; **Georgia,** Tybee Beach; **Texas,** Brownsville, Corpus Christi, Sinton, Sarita, Boca Chica.

Types in the Collection of the California Academy of Science.

A letter from Doctor E. S. Ross of the Calif. Acad. of Sci., in regard to the Van Duzee type specimens reads in part as follows: "Van Duzee has selected and catalogued a lectotype (No. 3036) and an allotype (No. 3036) for **Stobaera 4-pustulata.** Both specimens are labeled Estero, Fla., May 6-12-08." These specimens are here designated.

16. **Pissonotus (Pissonotus) rubrilatus** n. sp.

Brachypterous form:

Resembles **Pissonotus niger** but smaller, reddish brown in color and males lack large U-shaped flap on venter of genital capsule. Length ♂ 2.2 mm.; ♀ 2.8 mm.

Structure: Second segment of antennae about twice as long as first; front about twice as long as greatest width, narrowed toward each end, more so toward base, carinae distinct; crown almost one-fourth longer than basal width, widest at apex, carinae indistinct; elytra almost quadrate, apices nearly truncate, corners rounded, veins raised; dorsum of abdomen covered with very short white hairs set more than their own length apart; genital segment of male conspicuous from above, about two-thirds width of preceding segment.

Color: Head, thorax and elytra reddish brown, fading to deep brown on abdomen; basal segment of antennae dark brown, almost black, second segment lighter; genital capsule of male light brown above, shading to darker below; legs more or less dark brown with reddish cast basally, light yellow apically.

Genitalia: In lateral view pygofer of male greatly narrowed on caudal margin with a small tooth at ventro-caudal corner; median processes long and slender, slightly sinuate, apices sharp; aedeagus widest at base, tapering gradually to narrow rounded apex, ventral margin slightly swollen near outer third, two slender retrorse processes on dorsal margin near apex, first slightly longer than second, about half as long as shaft of aedeagus; anal segment with pair of long slender processes. In ventral view styles constricted near middle, broadest just before small, overhang-

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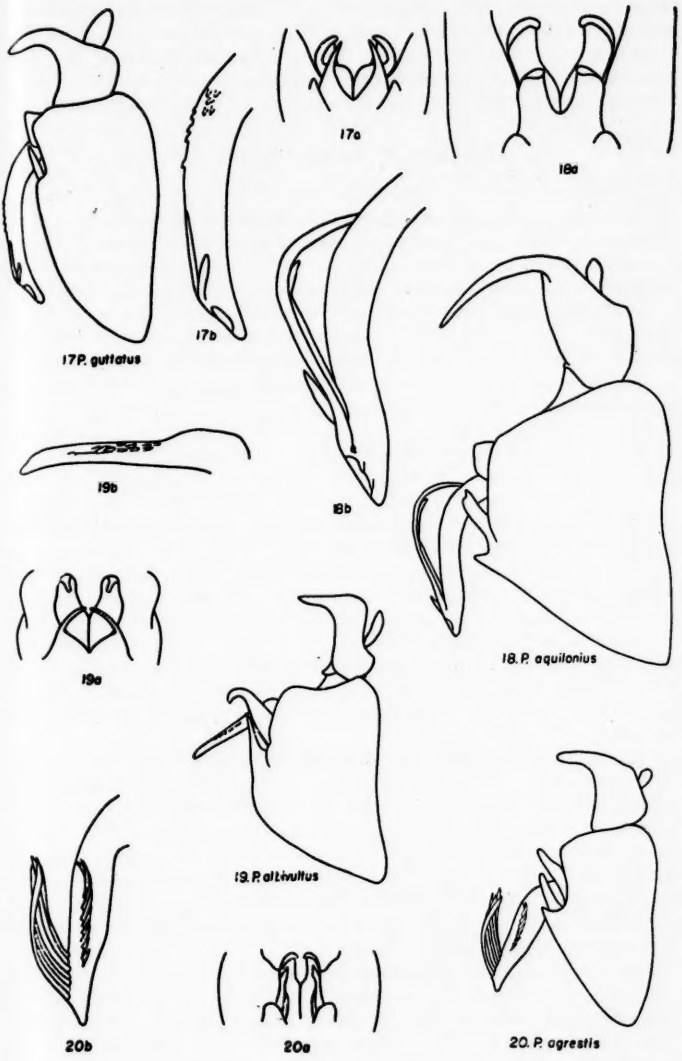
PLATE V

17 P. **(Pissonotus) guttatus** Spooner, lateral view of ♂ genital capsule; 17a, ventral view of styles and processes in position; 17b, lateral view of aedeagus.
18 P. **(Pissonotus, aquilonius** n. sp., lateral view of ♂ genital capsule; 18a, ventral view of styles and processes in position; 18b, lateral view of aedeagus.
19 P. **(Pissonotus) albivultus** n. sp., lateral view of ♂ genital capsule; 19a, ventral view of styles and processes in position; 19b, lateral view of aedeagus.
20 P. **(Pissonotus) agrestis** n. sp., lateral view of ♂ genital capsule; 20a, ventral view of styles and processes in position; 20b, lateral view of aedeagus.


17a
18a
17P. guttatus
17b
18b
19b
18. P. aquilonius
19a
19. P. altivultus
20b
20a
20. P. agrestis

ing apices; median pair of processes widest at base, narrowed to sharp apices, converging slightly, ending short of apices of styles; lateral pair of processes of pygofer small, about as wide as long.

Holotype ♂, allotype ♀, 16 ♂ and 3 ♀ paratypes, Rabbit Ear Pass, Colo., Aug. 3, 1947, R. H. Beamer.

Types in Snow Entomological Collections.

17. **Pissonotus (Pissonotus) guttatus** Spooner

Pissonotus guttatus Spooner, Canadian Ent., 44, p. 233, 1912.

"Brachypterous ♀. Eyes oval, deeply indented below to receive the antennae, colour grey; vertex considerably longer than wide, slightly rounded in front, projecting slightly before the eyes; carinae of the vertex all present, rather indistinct; vertex uniformly black except the caudo-lateral angles which are slightly yellowish. Carinae meeting on the front just below the curve of the vertex, extending distinctly from this point throughout the length of the front, indistinct on the vertex; front considerably constricted between the eyes, deep pitchy black above, becoming gradually lighter until it is white at the base; clypeo-frontal suture curved, the clypeus deep uniform black with the median carina distinct; the black colour of the clypeus extends as a band across the anterior coxae as is characteristic of the genus.

"The second segment of the antennae about one-fourth as long again as the first, with a few protuberances; antennae uniform pale honey-yellow.

"The length of the prothorax from the anterior to the caudal margins about equal to that of the vertex; caudal margin slightly concave, carinae distinct; anterior portion deep, shiny black; narrow band on posterior margin dirty white.

"Legs normal, pale honey-yellow except tips of the tarsi which are black and two slender brown lines on the outer sides of the tibiae.

"Scutellum triangular, sides very slightly arcuate; median carina distinct; lateral carina inconspicuous, reaching the posterior margin; colour uniform honey-yellow.

"Elytra short, extending to the middle of the first abdominal segment, coriaceous, highly polished, veins almost obliterated; colour pale honey-yellow with an oval blotch of white in the centre of the apical margin; abdomen honey-yellow but slightly darker than the scutellum and elytra.

"Genitalia uniform honey-yellow, paler than the tergum; pygofers tapering to a rounded point; plates extending about one-third the length of the pygofers; anal style white. Length 3.5 mm.

"Described from a single female taken at Ithaca, N.Y., Aug. 1st. 1896. Type in collection of Cornell University.

"Very close to **P. delicatus** Van Duzee but easily separable from it by the black front, vertex and prothorax. The prothorax lacks the foveae so conspicuous in **delicatus** and the shape of the front is quite different."

In the series studied, the black color is not always present on the thorax as stated in the original description, and in a few instances even the posterior portion of the vertex is light colored. Length ♂, 2.2 mm.

Genitalia: In lateral view pygofer of male much wider than long, longest on dorsal margin, slight excavation near dorsum of caudal margin exposing apex of median process and tip of style; aedeagus widest at base, sides subparallel, slightly narrowed almost to apex where dorsal margin is suddenly narrowed to rounded apex, shaft gently curved ventrally throughout, dorsal margin and left side more or less set with processes and short teeth, processes usually so close to shaft as to often be invisible except in high power compound microscope; anal segment with a pair of heavy processes of medium length. In ventral view styles with both margins sinuately curved, apices broadly rounded with outer margin overhanging; median processes widest at base, narrowed throughout, curved, apices broadly rounded with outer margin overhanging; lateral processes of pygofer vestigial.

Allotype ♂ and 14 ♂ parallotypes, Storrs, Conn., August 5, 1946, R. H. Beamer; other parallotypes: 3 ♂♂, Boscawen, N.H., August 12, 1946, R. H. Beamer; 3 ♂♂, Rome, Ohio, July 19, 1946, R. H. Beamer; 8 ♂♂, Lancaster, N.Y., July 25, 1946, R. H. Beamer; 1 ♂, Fredonia, N.Y., July 21, 1946, R. H. Beamer; 1 ♂, Washington, D.C., October 10, 1941, P. W. Oman; 1 ♂, Annapolis Md., June 24, 1937, P. W. Oman; 1 ♂, Toronto, Ontario, Canada, August 8, 1924, E. D. Ball.

Allotype and parallotypes in Snow Entomological Collections; parrallotypes in U.S. National Museum.

Macropterous form:

Similar to brachypterous form but with head and anterior half of thorax black and band of white at base of clypeus only about one-half as wide as in brachypterous specimens. Flight wings fully developed, elytra extending about one-third their length beyond tip of abdomen, widest beyond cross-veins; elytra hyaline, with veins and base smoky in color.

Holomorphotype ♀ and 2 ♀♀ paramorphotypes, Lancaster, N.Y., July 25, 1946, R. H. Beamer; other paramorphotypes: 2 ♀♀, Fredonia, N.Y., July 21, 1946, R. H. Beamer.

Types in Snow Entomological Collections.

18. **Pissonotus (Pissonotus) aquilonius** n. sp.

Brachypterous form:

Resembles **Pissonotus guttatus** Spooner but anterior half of pronotum and crown of same color as remainder of body instead of much darker. Length, ♂ 2.3 mm.; ♀ 2.8 mm.

Structure: Second segment of antennae about twice as long as first; clypeus not quite twice as long as greatest width, sides subparallel for most of their length, narrowed toward each end, more so toward base, tricarinate, median carina fading out toward base; crown longer than wide, widest at apex, apex rounded; elytra about as long as broad in ♀, longer than broad in ♂, apices truncate with corners rounded, veins slightly raised, not distinctly reaching hind margin; dorsum of abdomen set with fine white hairs, less than their length apart.

Color: Body color piceous, antennae soiled yellow with smoky cast on basal segment; clypeus lighter at apex; posterior half of pronotum white;

veins of elytra same color as membrane, broad white band across apices of elytra; legs yellow with brown markings.

Genitalia: In lateral view pygofer of male strongly narrowed on caudal margin; lateral and median processes form a more or less pediform process on ventral corner of this margin; aedeagus long and slender, sides almost parallel, curved gradually toward venter, apical fifth bent slightly dorsad, dorsal margin of apex with 3-4 slender, retrorse processes, one of which is more than half as long as shaft; anal segment with a pair of very long, slender, processes. In ventral view styles about twice as long as median processes, sinuate, apices rounded and overhanging slightly more than in median processes; median processes considerably longer than wide, apices broadly rounded, overhanging; lateral processes of pygofer but slightly produced, about as long as wide.

Holotype ♂, allotype ♀, 1 ♂ and 1 ♀ paratypes, Brule, Wis., August 16, 1937, R. H. Beamer.

Types in Snow Entomological Collections.

19. Pissonotus (Pissonotus) albivultus n. sp.

Brachypterous form:

Resembles **Pissonotus aquilonius** but first segment of antennae black, carinae of clypeus and crown light colored and scutellum with at least some light color. Length ♂ 1.9 mm.; ♀ 2.4 mm.

Structure: First segment of antennae two-thirds as long as second; clypeus about twice as long as greatest width, widest near apical fourth, narrowed toward each end, more so toward base, carinae distinct; crown longer than wide, carinae very prominent; elytra about as wide as long, apices broadly rounded, veins slightly raised, indistinct, not distinctly reaching hind margin; abdomen with a few long white hairs along lateral margins.

Color: General color usually dark brown although some specimens are lighter; first segment of antennae dark brown, second segment lighter; clypeus dark brown, with narrow transverse band at apex and carinae much lighter; crown with fovae dark brown and carinae quite light; apical portion of pronotum white, mesonotum varying from dark brown to almost white; elytra brownish-semihyaline with broad white band across apices, this band sometimes almost bisected by brown spot in center; abdomen dark brown with light spot at apex and in some specimens a more or less light longitudinal stripe.

Genitalia: In lateral view pygofer of male more or less rectangular, caudal margin broken by the dorsally projecting, long, slender, median process; aedeagus widest near base, shaft almost straight with sides narrowing to rather sharp apex, dorsal margin on about middle half more or less covered with short ridges or serrations; styles visible for most of their length, widest at base, narrowing rapidly to sharp apices; anal segment with a pair of rather sharp, scarcely curving, fairly short, processes. In ventral view styles widest near middle, narrowed to rounded apices which overhang in a sharpened point; median processes very wide at base, greatly narrowed at middle to very long, slender, inwardly directed apices.

Holotype ♂, allotype ♀, 13 ♂ and 8 ♀ paratypes, Otter Creek, Fla., March 9, 1947, R. H. Beamer; other paratypes: 7 ♂ ♂ and 6 ♀ ♀, same date and place, L. D. Beamer; 28 ♂ ♂ and 16 ♀ ♀, La Belle, Fla., March 13, 1947, R. H. Beamer; 1 ♀, Royal Palm Park, Fla., March 16, 1947, R. H. Beamer. Types in Snow Entomological Collections.

20. Pissonotus (Pissonotus) agrestis n. sp.

Brachypterous form:

Resembles **Pissonotus paludosus** but with a distinct, rather broad, transverse, white band across apex of clypeus and male aedeagus with a series of from 8-10, very closely set, retrorse processes on dorsal margin of apex. Length ♂ 1.8 mm.; ♀ 2.3 mm.

Structure: First antennal segment a little more than half as long as second; clypeus not quite twice as long as wide, widest near apical third, strongly narrowed toward each end, more so toward base, distinctly tricarinate; crown longer than wide, carinae indistinct; elytra about as long as wide, almost truncate, corners broadly rounded, veins indistinct, slightly raised, not reaching apices; median longitudinal carina of dorsum of abdomen present.

Color: General color dark brown to black; dorsum of pronotum, broad band on apices of elytra and fairly broad band on apex of clypeus white; first segment of antennae almost black, second lighter; legs stramineous with darker markings on femora.

Genitalia: In lateral view pygofer of male almost triangular with a broad excavation in caudal margin; median process and outer half of style rather slender, tapering to pointed apices and more or less converging dorsally; aedeagus widest near basal third, bent ventrally in same region, sides narrowed slightly to apex, 8-10 long, slender, retrorse processes on dorsal margin at apex, about same number of shorter retrorse spines or processes on right side beginning near apical third and reaching to basal third; anal segment with a pair of short, stout processes with rounded apices. In ventral view styles long and rather slender, sinuate, apices rounded with apical portion overhanging; median processes almost as long as styles, slender, tapering to sharp apices; lateral processes rounded humps, as broad as long.

Holotype ♂, and allotype ♀, Marianna, Fla., March 3, 1947, R. H. Beamer; paratypes: 1 ♀, Storrs, Conn., August 4, 1946, R. H. Beamer; 3 ♂ ♂ New Port Ritchey, Fla., October 7, 1938, P. W. Oman; 1 ♂, Waycross, Ga., October 5, 1938, P. W. Oman; 1 ♀, Sanford, Fla., September 10, 1925, E. D. Ball; 1 ♀, Sanford, Fla., November 9, 1926, E. D. Ball; 1 ♀, Sanford, Fla., Feb. 2, 1926, E. D. Ball.

Types and paratype in Snow Entomological Collections; paratypes in U.S. National Museum and Collection of E. D. Ball.

21. Pissonotus (Pissonotus) merides n. sp.

Brachypterous form:

Resembles **Pissonotus albivultus** but frontal carinae and metathorax not marked with white and aedeagus of male enlarged on outer third and

with four retrorse processes on dorsal margin of apical third. Length ♂ 2.1 mm.; ♀ 2.8 mm.

Structure: First segment of antennae about one-half as long as second; clypeus about twice as long as wide, widest near middle, narrowed toward each end, more so toward base, distinctly tricarinate; crown longer than wide, widest at apex, apex rounded, carinae not distinct; elytra coriaceous, about as long as broad, apices almost truncate with corners rounded, veins slightly raised, not distinctly reaching hind margin; lateral margin of abdomen with a few long white hairs, more numerous on male genital segment; dorsum of abdomen with a distinct longitudinal carina.

Color: General body color pitchy black, apical margins of pronotum and elytra white; antennae varying from dark brown to black; legs dark, venter, clypeus and clypellus black with faint, light transverse line at apex of clypeus.

Genitalia: In lateral view pygofer of male more or less rectangular with lateral process forming a sharp tooth near middle of caudal margin and median process extending dorsally from lateral tooth in a much sharper and longer projection; style visible for almost whole length, widest near outer third, narrowed to sharp apex on inner margin; aedeagus widest on outer third, gradually curved ventrally, dorsal margin of apical third with four retrorse processes, first at least twice as broad as any other and about half as long as shaft, second and fourth about one-third as wide as first and nearly as long, the third about one-half as wide as second and less than half as long; anal segment with a pair of long, slender, sinuate processes. In ventral view styles narrowest near middle, slightly widened to broadly rounded apices, overhanging on outer margin; median processes widest at base, more or less avicephaliform with long, slender, inward pointing, beak; lateral processes mere projections about as long as wide.

Holotype ♂, allotype ♀, 6 ♂ and 2 ♀ paratypes, Mobile, Ala., March 20, 1947, R. H. Beamer; other paratypes: 1 ♀, same place and date, L. D. Beamer; 2 ♂♂ and 1 ♂, Pearlington, Miss., March 3, 1947, R. H. Beamer; 1 ♂, Ocean Springs, Miss., March 5, 1947, R. H. Beamer; 3 ♂♂ and 2 ♀♀, Mariana, Fla., March 7, 1947, R. H. Beamer.

Types in Snow Entomological Collections.

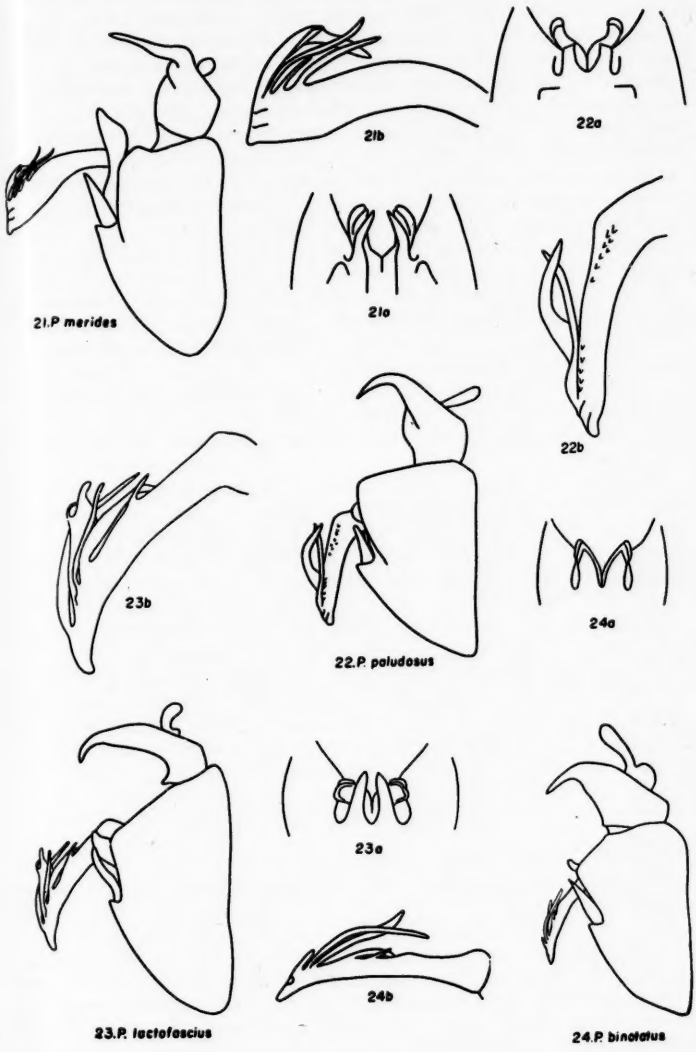
22. **Pissonotus (Pissonotus) paludosus** n. sp.

Brachypterous form:

Resembles **Pissonotus merides** but legs light fulvous to white instead of brown and aedeagus narrower at apex than at base. Length ♂ 2.1 mm.; ♀ 2.8 mm.

PLATE VI

21 P. **(Pissonotus) merides** n. sp., lateral view of ♂ genital capsule; 21a, ventral view of styles and processes in position; 21b, lateral view of aedeagus.
22 P. **(Pissonotus) paludosus** n. sp., lateral view of ♂ genital capsule; 22a, ventral view of styles and processes in position; 22b, lateral view of aedeagus.
23 P. **(Pissonotus) lactofascius** n. sp., lateral view of ♂ genital capsule; 23a, ventral view of styles and processes in position; 23b, lateral view of aedeagus.
24 P. **(Pissonotus) binotatus** Spooner, lateral view of ♂ genital capsule; 24a, ventral view of styles and processes in position; 24b, lateral view of aedeagus.


21.P merides
21b
21a
22a
22b
23b
22.P paludosus
24a
23a
24b
23.P. lactofascius
24.P. binotatus

Structure: First segment of antennae about one-half as long as second; clypeus not quite twice as long as wide, widest near outer third, narrowed toward each end, slightly more so toward base, distinctly tricarinate; crown longer than wide, carinae indistinct; elytra about as broad as long, apices almost truncate with outer corners broadly rounded, veins indistinct, slightly raised, not distinctly reaching the apices; dorsum of abdomen sparsely covered with short white hairs, distinct, median, longitudinal carina on dorsum of abdomen.

Color: General body color black; posterior half of pronotum and broad band on apices of elytra, white; antennae brown to light fulvous; legs stramineous to almost white.

Genitalia: In lateral view pygofer of male more or less rectangular, narrowed on caudo-ventral corner; caudal margin broken by lateral process forming a sharp tooth and median process forming a long slender tooth projecting dorsally; only rounded apex of style visible; aedeagus widest near base, curving ventrally, dorsal margin of apex with two retrorse processes, more than half as long as shaft; anal segment with a pair of long slender, curved processes. In ventral view styles widest near middle, sinuately curved to rounded, overhanging apices; median processes widest at base, overall shape more or less rectangular; lateral processes barely visible.

Holotype ♂, allotype ♀, 6 ♂ and 7 ♀ paratypes, Marianna, Fla., March 7, 1947, R. H. Beamer; other paratypes: one pair, same place and date, L. D. Beamer; 3 ♂♂ and 3 ♀♀, Saucier, Miss., March 5, 1947, R. H. Beamer; 1 ♀, Mobile, Ala., March 20, 1947, R. H. Beamer; 1 ♂, Ocean Springs, Miss., March 5, 1947, L. D. Beamer; 2 ♂♂, Pearlington, Miss., March 3, 1947, R. H. Beamer; 2 ♂♂ and 1 ♀, Melbourne, Fla., March 17, 1947, R. H. Beamer; 3 ♂♂ and 2 ♀♀ Woodville, Fla., March 7, 1947, R. H. Beamer; 2 ♂♂, Ponce de Leon, Fla., March 7, 1947, R. H. Beamer; 2 ♂♂ and 1 ♀, same place and time, L. D. Beamer; 1 ♀, Lamont, Fla., March 7, 1947, R. H. Beamer; 1 ♀, same place and time, L. D. Beamer; 1 ♂, Covington, La., March 3, 1947, R. H. Beamer; 2 ♂♂, Slidell, La., March 3, 1947, R. H. Beamer; 1 ♂, Hilliard, Fla., July 6, 1939, R. H. Beamer.

Types and paratypes in Snow Entomological Collections.

23. **Pissonotus (Pissonotus) lactofascius** n. sp.

Brachypterous form:

Resembles **Pissonotus binotatus** but general color practically black and median processes of male in ventral view as long as or longer than styles. Length ♂ 2 mm.; ♀ 2.4 mm.

Structure: First segment of antennae one-half as long as second; clypeus not quite twice as long as broad, broadest near apical third, narrowed toward each end, very slightly more so toward base, definitely tricarinate; crown slightly longer than broad, carinae indistinct; elytra about as broad as long, apices almost truncate, outer corner rounded, veins indistinct, slightly raised, not definitely passing through white apical border; dorsum of abdomen with sparsely set, short, white, hairs.

Color: General color very dark brown to black, with broad white band on apices of elytra and narrow, transverse, white band at apex of clypeus; basal segment of antennae dark, almost black, second segment lighter; legs variable from light yellow to dark brown.

Genitalia: In lateral view pygofer of male almost triangular, with a broad shallow notch in posterior margin; median process extending dorsally as a slender, sinuate, sharp pointed process; style exposed for about half its length, widest near outer third, narrowed to rounded apex; anal segment very short, greatly extended caudally into a pair of sharp processes; aedeagus with shaft bent ventrally near base, sides almost parallel, dorsal margin with numerous retrorse processes of varying widths, one even forked. In ventral view styles bent outward near middle, apices broadly rounded, narrowly overhanging; median processes as long as or longer than styles, slightly converging with apices pointed.

Holotype ♂, allotype ♀, and 4 ♂ and 3 ♀ paratypes, Rabbit Ear Pass, Colo., August 3, 1947, R. H. Beamer; other paratypes: 4 ♂♂ and 7 ♀♀, Pingree Park, Colo., August, 1924, Beamer and Lawson; 1 ♂ and 1 ♀, same place and collectors, August, 1925; 4 ♀♀, Northgate, Colo., August 20, 1931, R. H. Beamer; 1 ♀, Poudre Canyon, Colo., August 22, 1925, Beamer and Lawson; 1 ♀, Yellowstone Park, Wyo., Frying Pan Lake, August 15, 1931, R. H. Beamer.

Types in Snow Entomological Collections.

24. Pissonotus (Pissonotus) binotatus Spooner

Pissonotus binotatus Spooner, Canadian Ent., 44, p. 239, 1912.

"Brachypterous ♀. Form and general appearance of **P. marginatus,** but considerably smaller.

"Eyes oval, deeply indented below to receive the antennae; colour dark gray, almost black, with a yellow margin; vertex about as long as wide, very slightly produced before the eyes, anterior margin slightly curved; carinae all present, very pronounced, posterior foveae very deep; colour uniform dark reddish brown.

"Front about one and one-third times as long as broad, widest below the eyes, sides slightly arcuate; clypeo-frontal suture straight, median and lateral carinae quite prominent, median carina forked just below the apex of the head; colour uniform reddish-brown, except a very narrow band along the clypeo-frontal suture, which is light yellow.

"Clypeus of the form of a truncated triangle; median carina fairly prominent; colour black, the black band extending across the anterior coxae.

"Basal segment of the antennae a little less than one-half the length of the second; the second segment lacks the protuberences so often found; basal segment reddish brown, second segment light yellow.

"Prothorax a little deeper than the head, caudal margin almost straight, very slightly emarginate on the sides and a suggestion of an emargination in the centre; median carina very prominent, lateral carinae strong on proximal two-thirds of the prothorax, fading out before reaching the posterior margin; colour uniform reddish brown.

"Anterior legs yellow, lineated with brown; second and third pairs of legs with yellow coxae, femora and proximal half of tibiae brown, the tibiae becoming gradually lighter in colour toward the distal end, the distal end of the tibiae and first two tarsal segments light yellow, almost white; last tarsal segment dark brown; tarsal spur rather small, light yellow, almost white.

"Scutellum triangular, about one and one-third times as deep as the prothorax, sides straight, median and lateral carinae prominent, the latter attaining the posterior margin; colour uniform reddish brown.

"Elytra short, practically covering the first abdominal segment, highly polished, veins indistinct; colour reddish brown, with two yellowish white dots on the apical margin of each elytron.

"Abdomen unformly reddish brown, a prominent carina extending along the middle of each tergum; genitalia reddish brown, pygofers ending in rather a sharp point; plates short, extending only one-third the length of the pygofers, a little lighter in colour; style white. Length, 2 mm.

"Brachypterous ♂. Form and markings the same as that of the female, considerably smaller in size. Genitalia, aperture of the pygofers quite long and narrow, superior wall of the anal tube produced in long outcurving horns, these rest on projecting points of the ventral margins of the pygofers; styles small; anal style light yellow, rest of the genitalia dark reddish brown. Length 1.5 mm.

"This species resembles **P. marginatus** quite closely. It is a much smaller species, there are distinct differences in the proportions of the front and antennae, the spur is smaller proportionally. There are also differences in the genitalia and some noticeable colour differences. **P. binotatus** lacks the white on the prothorax, the front is much darker, and has two white spots on the apical margin of the elytra instead of a full white band as in **marginatus.**

"Types of the male and female taken at De Witt, Mitchell Co., Ga., April 6, 1912, by the author. Types in the author's collection."

The body color of this species varies greatly with the season in which they are collected. The summer forms are usually honey-colored and those taken during winter or early spring are almost black. The yellowish dots on the apical margin of the elytra vary from very small to large, which may fuse together and form a white, unbroken band along the apical margin in some specimens.

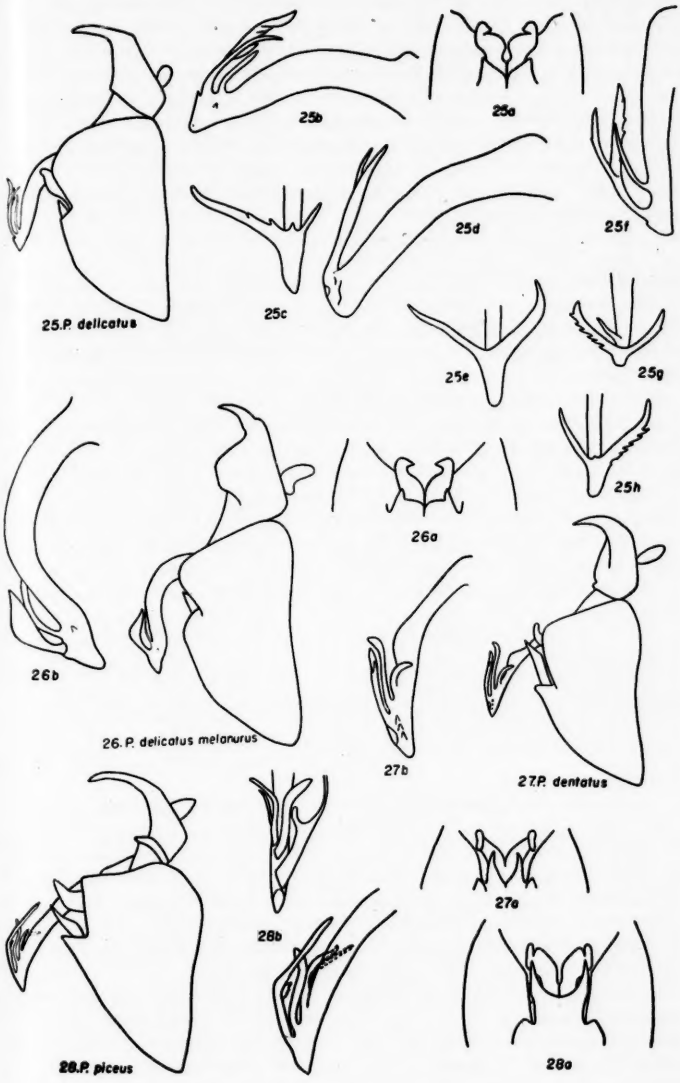
PLATE VII

25 P. **(Pissonotus) delicatus** Van Duzee, lateral view of ♂ genital capsule; 25a, ventral view of styles and processes in position; 25b, lateral view of aedeagus of ♂ from California; 25c, dorso-ventral view of tip of aedeagus from California; 25d, lateral view of aedeagus from Douglas, Co., Kans.; 25e, dorso-ventral view of tip of aedeagus from Douglas Co., Kans.; 25f, lateral view of aedeagus from Medora, Kans.; 25g, dorso-ventral view of tip of aedeagus from Medora, Kansas; 25h, dorso-ventral view of tip of aedeagus from Florida.

26 P. **(Pissonotus) delicatus melanurus** Van D., lateral view of ♂ genital capsule; 26a, ventral view of styles and processes in position; 26b, lateral view of aedeagus.

27 P. **(Pissonotus) dentatus** n. sp., lateral view of ♂ genital capsule; 27a, ventral view of styles and processes in position; 27b, lateral view of aedeagus.

28 P. **(Pissonotus) piceus** (Van Duzee), lateral view of ♂ genital capsule; 28a, ventral view of styles and processes in position; 28b, dorso-ventral view of tip of aedeagus above and lateral view of aedeagus below.


25b
25a
25d
25f
25c
25.P. delicatus
25e
25g
25h
26a
26b
26. P. delicatus melanurus
27b
27.P. dentatus
27a
28b
28.P. piceus
28a

Genitalia: In lateral view pygofer of male more or less triangular with a long sloping notch near the middle of the caudal margin; median process forming a long sharp-pointed projection visible in this notch; style barely visible at its apex; anal segment with a pair of rather short, sharp, processes; aedeagus widest at base, dorsal margin more or less sinuate with usually five, slender, retrorse processes on apical half, first quite short, second and third about half as long as shaft and other two shorter. In ventral view styles short, more or less parallel-sided, diverging on outer half, apices rather blunt, slightly over-hanging; median broad with sharp apices, almost as long as styles.

Types in collection of Doctor Spooner.

Macropterous form:

Like brachypterous form, but with flight wings, elytra extending beyond end of abdomen by about one-third their length, whitish, hyaline, veins darker. Apex of scutellum usually light colored and whole pronotum often mottled in color.

Holomorphotype ♂, allomorphotype ♀, 1 ♂ and 3 ♀ paramorphotypes, Billys Id., Okefenokee Swamp, Ga., July 27, 1939, R. H. Beamer; other paramorphotypes: 6 ♀♀, Okefenokee Swamp, Ga., July 27, 1939, D. E. Hardy; 1 ♀, same time and place, A. T. Hardy; 3 ♀♀, La Belle, Fla., July 16, 1939, P. B. Lawson; 1 ♂, Suwanee Springs, Fla., August 2, 1939, A. T. Hardy; 1 ♂, Cocoanut Grove, Fla., August 9, 1930, P. W. Oman; 1 ♀, Woolwine, Va., Sept. 1, 1946, R. H. Beamer; 1 ♀, Raleigh, N.C., August 30, 1946, R. H. Beamer.

Morphotypes in Snow Entomological Collections.

25. **Pissonotus (Pissonotus) delicatus** Van Duzee

Pissonotus delicatus Van Duzee, Bull. Buff. Soc. Nat. Sci., 5, pp. 227, 237, 1897.
Pissonotus pallipes Gillette and Baker, Hemip. Colorado, p. 69, 1895, (listed) (Nom. nud.).
Pissonotus pallipes Van Duzee, Bull. Buff. Soc. Nat. Sci., 5, pp. 227, 238, 1897.
Pissonotus giffardi Van Duzee, Proc. Calif. Acad. Sci., (4) 14, p. 407, 1925. (New synonymy).
Pissonotus pallipes Oman, Iowa State Jour. Sci., 21, No. 2, Jan. 1947, pp. 217, 220.

Brachypterous form:

"Form of **P. marginatus**, but smaller with the front a little narrower. Color pale honey-yellow; face marked with the usual piceous band which covers the base of the clypeus and crosses the anterior coxae. Apical margin of elytra white; apex of the front whitish; knees, tips of the tarsi, a streak on the outer surface of the anterior and intermediate tibiae, and the extreme point of the oviduct dark brown. Length 2½ mm.

"California. Described from a single female specimen received from Mr. D. W. Coquillett and captured near Los Angeles."

Structure: First segment of antennae about half as long as second; clypeus not quite twice as long as greatest width, widest near basal third, tapering toward both ends, strongly tricarinate; crown longer than wide, strongly carinate; elytra almost as wide as long, apices almost truncate with corners rounded, veins slightly raised, not definitely reaching hind margin.

Color: General color honey-yellow, darker stripe across front coxae and clypellus and another across clypeus and pleura; first segment of antennae usually dark brown, second segment stramineous; sides of pronotum often darker; legs usually longitudinally lineate with darker; elytra with a broad white stripe on apices.

Genitalia: In lateral view pygofer quite rounded on caudal margin with a broad V-shaped notch in which the sharp pointed tip of the median process and the rounded apex of the style is visible; aedeagus with shaft widest at base, slightly sinuate, narrowed somewhat to just before apex where it is widened, dorsal margin of apex with 2-3 retrorse processes, apical one very short and often absent, second the longest, about half as long as shaft, divided near middle, left-hand portion much longer and heavier, often with one margin more or less serrated (there is apparently a great deal of variation in the number and form of these processes, specimens from the same locality may have opposite symmetry); anal segment with a pair of rather narrow sharp-pointed processes. In ventral view styles widest near middle, narrowed to more or less avicephaliform apices, also narrowed basally; median processes broad at base, narrowed on inner margin to sharp apices.

Holotype ♀ designated by Oman, in collection at Iowa State College, Ames, Iowa; allotype ♂, Huntington Beach, Calif., July 30, 1932, R. H. Beamer; parallotypes: 1 ♂, Bonsall, Calif., August 6, 1935, R. H. Beamer; 1 ♂, Carlsbad, Calif., August 6, 1935, R. H. Beamer. Allotype and parallotypes in Snow Entomological Collections.

This species seems to be one of the most common in this genus. The 800 specimens studied represent many localities in California, Arizona, Colorado, Texas, Kansas, Florida, and New York. The specimens from Arizona were on **Grindelia** sp. and those from Kansas on **Prionopsis ciliata** Nutt.

A comparison of the paratypes of **Pissonotus giffardi** Van Duzee with the type of **Pissonotus delicatus** Van Duzee revealed the fact that they represent but a single species. Therefore, **Pissonotus giffardi** (1925) becomes a synonym of **Pissonotus delicatus** (1897).

26. Pissonotus (Pissonotus) delicatus melanurus Van Duzee

Pissonotus delicatus melanurus Van Duzee, Proc. Calif. Acad. Sci., 7, p. 311, 1917.

"Like the typical form in every respect except that the fulvous portions are deepened to piceous in the female or black in the male. The genital characters are obscure but do not seem to differ in any respect from those of the species. This is a pretty form of a piceous or deep black color with the head, pronotum and broad apical margin of the elytra white; the base of the tergum beneath the white margin of the elytra is pale or fulvous. Mr. Giffard took a long series in San Joaquin Co., near Tracy, the last of May, 1917, on **Grindelia camporum.** About one-fourth of those taken were males. Some of the females are as deeply colored as are the males, but some are nearly as pale as some examples of **delicatus** from Florida now in my collection. The darker males have the femora mostly black and a black

line on the base of the tibiae above, the basal segment of the antennae is black and the front is infuscated below.

"Holotype (No. 378), male, from San Joaquin Co., in collection of the California Academy of Sciences.

"Allotype, female, from San Joaquin Co., in collection of M. Giffard."

Brachypterous form:

Structure: First segment of antennae definitely more than half as long as second; clypeus about twice as long as wide, sides almost parallel on apical two-thirds, slightly narrowed toward base, almost not at all toward apex, strongly tricarinate; crown longer than width at base, slightly wider at apex, carinae indistinct over anterior half; elytra about as wide as long, veins indistinct, not reaching hind margin.

Color: General color light brown; band across front coxae and clypellus, first segment of antennae and most of lateral portion of pronotum, almost black; broad band on apices of elytra white.

Genitalia: In lateral view pygofer of male more or less triangular with rather deep V-shaped notch in caudal margin; sharp pointed median process barely visible; styles usually hidden; aedeagus widest at base, strongly arcuate ventrally, slightly bent dorsally at apex, dorsal margin of apex with two retrorse processes, about one-third length of shaft, apical one greatly flattened and widened on outer two-thirds; anal segment with a pair of short, sharp processes. In ventral view styles widest on basal two-thirds, narrowed into more or less avicephaliform apices; median processes broad at base, extended into sharp point on outer corners.

Material Studied: 51 specimens, with paratype labels, San Joaquin Co., Calif., May 30-31, 1917, W. M. Giffard; 74 specimens, Tracy, Calif., June, 1920, W. M. Giffard. Types in California Academy of Science Collections except one pair of paratypes from which the above description was made, in Snow Entomological Collections.

27. **Pissonotus (Pissonotus) dentatus** n. sp.

Brachypterous form:

Resembles **Pissonotus piceus** but smaller, crown extends perceptably less in front of eyes and aedeagus with several sharp teeth placed laterally near apex. Length ♂ 2.25 mm.; ♀ 2.7 mm.

Structure: First segment of antennae about one-half as long as second; clypeus slightly more than twice as long as wide, widest near apical third, narrowed toward each end, slightly more so toward base, definitely tricarinate; crown about one-fourth longer than wide, widest at apex, carinae distinct; elytra about as broad as long, apices almost truncate with corners rounded, veins raised, not definitely reaching hind margin, with few setae on raised pedicles on veins; dorsum of abdomen with a few, very short, fine, thinly scattered, white hairs.

Color: General color brown; legs usually stramineous; elytra usually with a white spot on outer apical corner with sometimes a smaller one on inner apical corner and occasionally the two connected.

Genitalia: In lateral view pygofer of male with caudal margin of pygofer narrowed with a large V-shaped notch in which is visible a rather long,

sharp-pointed median process and the dorsally curving apex of style; aedeagus with quite long shaft with a raised hump near middle of dorsal margin; three long, slender, retrorse processes on apical third of dorsal margin and three short, sharp teeth on each side of shaft opposite ejaculatory duct; anal segment with a pair of curving, sharp-pointed processes. In ventral view styles widest near middle, curved outward and slightly narrowing to more or less pediform apices; median processes widest at base, narrowed to very sharp apices, about two-thirds as long as styles; lateral processes visible but very short.

Holotype ♂, allotype ♀, 43 ♂ and 15 ♀ paratypes, Inglis, Fla., March 9, 1947, R. H. Beamer; other paratypes: 18 ♂♂ and 6 ♀♀, same place and time, L. D. Beamer; 7 ♂♂, Otter Creek, Fla., March 9, 1947, R. H. Beamer; 3 ♀♀, La Belle, Fla., March 13, 1947, R. H. Beamer; 1 ♂, Melbourne, Fla., March 17, 1947, R. H. Beamer; 1 ♂, Lamont, Fla., March 7, 1947, R. H. Beamer; 1 ♂, Royal Palm State Park, Fla., March 16, 1947, R. H. Beamer.

Types in Snow Entomological Collections.

Macropterous form:

Like the brachypterous form but general color much darker with apex of scutellum white and with flight wings which extend beyond the abdomen by about one-third their length.

Holomorphotype ♂, allomorphotype ♀, 1 ♂ and 2 ♀ paramorphotypes, Inglis, Fla., March 9, 1947, R. H. Beamer; other paramorphotypes: 1 ♂, Sanford, Fla., March 11, 1947, R. H. Beamer; 1 ♂, same place and time, L. D. Beamer; 1 ♂ and 1 ♀, Otter Creek, Fla., March 9, 1947, R. H. Beamer; 2 ♀♀ and 1 ♂ same place and time, L. D. Beamer; 1 ♂, Zolfo Springs, Fla., March 12, 1947, L. D. Beamer.

Morphotypes in Snow Entomological Collections.

28. **Pissonotus (Pissonotus) piceus** (Van Duzee)

Megamelus piceus Van Duzee, Bull. Mich. Agr. Exp. Sta., 102, p. 8, pl. 1, figs, 5, 5a, 1894.

Pissonotus fulvus Metcalf, Jour. Elisha Mitchell Soc., 38, pp. 206, pl. 61, fig., 448; pl. 69, fig., 678, 1923. (New synonymy).

"Piceous—black; base of the vertex, keels and narrow hind edge of the pronotum, disc of the mesonotum, or at least its carinae, disc of the tergum, especially toward its base and apex, and the edge of the dorsal keel; the genital segments and sometimes the base of the center, brownish yellow. Face pale, shaded to brown above, clypeus deep black. Antennae, rostrum, tylus, and legs pale, soiled yellow, the latter lineate with brown. Elytra reaching to the second abdominal segment in the brachypterous form, with the apex truncated, piceous-brown, or even black, with the apical edge white more or less broadly interrupted with black at the middle; nervures strong, granulated. In the macropterous form the elytra extend considerably beyond the tip of the abdomen about as in **Liburnia pellucida;** they are smoky with pale granulated nervures, the exterior and interior of which are forked at about three-fourths their length. Pygofers of the male cylindrical, on their ventral aspect cut out for about one-half their length and carrying on the broad base of this incisure a broad and short projection

extended into a short conical divergent tooth at each angle, beyond this are the incurved spine-like stylets included between the long slender ventral projections of the plates. Length 2.5-3 mm.

"New York and Michigan. Described from many examples of both sexes taken in western New York on grass in low swampy meadows in August and September, and one female taken on celery at Kalamazoo, Mich., August 26, 1893, by Mr. G. C. Davis.

"In this species the vertex is shorter and broader, the pronotum shorter and the mesonotum longer with more divergent carinae than in **M. notulus.** The yellowish markings above vary much in extent, some specimens being almost entirely of a dull piceous black while some are pitchy brown with the pale markings much extended. The characters of the head, the pale face and the black vertex and clypeus seem quite constant as does also the color of the tylus, rostrum, legs and elytra."

Genitalia: In lateral view pygofer of male more or less triangular with a large V-shaped notch in caudal margin in which is visible the long, sharp-pointed median process and the narrowing, dorsally bent outer portion of the style; aedeagus with shaft almost parallel-sided, slightly curving ventrally and with usually four, retrorse processes on the dorsal margin of the apical third, apical processes longest, about half as long as shaft and divided; anal segment with a pair of fairly long, curving processes. In ventral view styles widest near outer third, narrowed to more or less rounded slightly overhanging apices; median processes widest at bases with inner margin narrowing to long sharp apices which end just short of apices of styles; lateral processes mere rounded bumps.

Lectotype ♂, Clarence, N.Y., Sept. 4, 1892, E. P. Van Dyke, designated by Oman, (Iowa State College Jour. Sci., Vol. 21, No. 2, Jan., 1947, p. 220) in collection of Iowa State College, cotypes in Cornell Collection, Ithaca, N.Y.

Material Studied: Over 700 specimens were at hand from many localities from Tucson, Arizona, eastward over the United States.

Dissected specimens of **Pissonotus fulvus** Metcalf were compared with a dissected cotype male of **Pissonotus piceus** (Van Duzee) November, 1945, and found to be identical. The former is therefore a synonym of the latter.

Host Plants: Ross and Mohr collected this species from **Jussiaea diffusa** in Illinois. The authors have collected it from **Rumex crispus** and **Polygonum** sp. in Kansas and Arizona.

29. Pissonotus (Pissonotus) dorsalis Van Duzee

Pissonotus dorsalis Van Duzee, Bull. Buff. Soc. Nat. Sci., 5, p. 190, 1894, (Listed). (Nom. nud.).
Pissonotus dorsalis Van Duzee, Bull. Buff. Soc. Nat. Sci., 5, p. 239, 1897.

"Closely allied to the preceding. Dull yellowish brown, paler beneath; broad lateral margin of the tergum, some marks on the connexivum and the base and apex of the pygofers in the female, piceus or blackish. Clypeus

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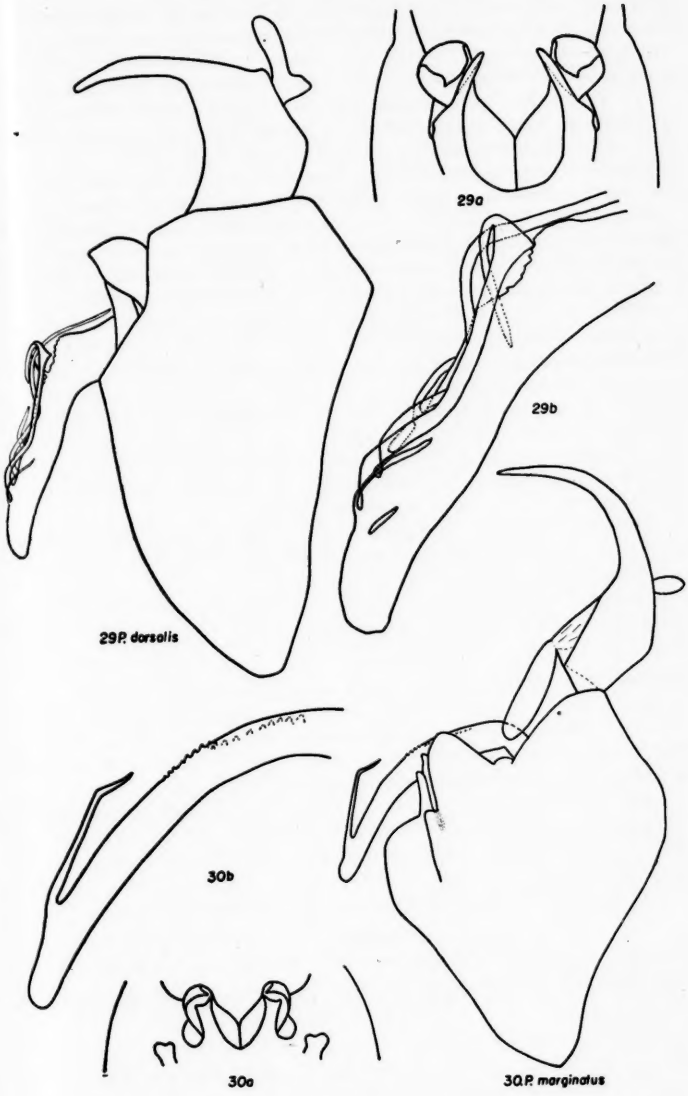
PLATE VIII

29 P. **(Pissonotus) dorsalis** Van Duzee, lateral view of ♂ genital capsule; 29a, ventral view of styles and processes in position; 29b, lateral view of aedeagus.
30 P. **(Pissonotus) marginatus** Van Duzee, lateral view of ♂ genital capsule; 30a, ventral view of styles and processes in position; 30b, lateral view of aedeagus.


29a
29b
29P. dorsalis
30b
30a
30P. marginatus

deep black with some obscure spots opposite the pleural pieces indicating a transverse band; claws of the anterior and intermediate feet blackish, front paling toward the base of the clypeus, immaculate above. Disc of the tergum quite obviously tinged with yellow. In the male the front, vertex and elytra have a reddish cast with the apical margins of the latter whitish, the nervures concolorous. Aperture of the pygofers in the male broadest below the middle, the stiles short and curved, their slender acute points approximated above, their base surrounded by the long curved ventral prolongation of the outer superior angles of the pygofers. Length about 3 mm.

"New York. Described from one pair captured in July, at Lancaster and Golden. This species may be distinguished from the preceding by the paler yellowish dorsum, and the brown, almost immaculate, front."

Genitalia: In lateral view pygofer of male broadly rounded on caudal margin with a shallow excavation at the middle in which the almost parallel-sided median process and the more or less rounded apex of the style is visible; aedeagus widest at base, bent ventrally before middle, with about five sinuous processes on dorsal margin on outer half; anal segment with a pair of long almost parallel-sided processes. In ventral view styles about as wide on outer third as at base, narrowed near middle with apices broadly rounded and overhanging; median processes widest at base, sharply narrowed near middle on outer margin to less than half basal width, gently converging to sharp apices.

Lectotype ♂, Lancaster, N.Y., July 12, 1889, E. P. Van Duzee, designated by Oman (Iowa State College Jour. Sci., Vol. 21, No. 2, 1947, p. 218).

Types in collection of Iowa State College.

Studied from about 100 specimens mostly from various localities in New York State. A few specimens are at hand from Wisconsin, Connecticut and Manitoba, Canada.

Macropterous form:

Like the brachypterous form, but with fully developed flight wings. These usually extend about one-third their length beyond the abdomen. The thorax is often much darker in this form, sometimes nearly black and the tip of the scutellum almost white.

Holomorphotype ♂, Otter Lake, N.Y., July 25, 1946, R. H. Beamer; allomorphotype ♀, 1 ♂ and 1 ♀ paramorphotype, Holland, N.Y., July 22, 1946, R. H. Beamer; 1 ♂ paramorphotype, Heart Lake, N.Y., July 30, 1946, R. H. Beamer.

Morphotypes in Snow Entomological Collections.

30. **Pissonotus (Pissonotus) marginatus** Van Duzee

Pissonotus marginatus Van Duzee, Bull. Buff. Soc. Nat. Sci., 5, 190. 1894. (Listed). (Nom. nud.).
Pissonotus marginatus Van Duzee, Bull. Buff. Soc. Nat. Sci., 5, pp. 236, 237, 238, 1897.
Pissonotus ater Van Duzee, Bull. Buff. Soc. Nat. Sci., 5, pp. 237, 227, 1897. (New synonymy).

Brachypterous form:

This species was named by Van Duzee from a single pair taken at Lancaster, N.Y., one in July and the other in September sometime before 1894. On or about June 20, 1923, these specimens were sent to W. M. Giffard in

Honolulu, Hawaii, by Carl Drake, then in charge of the insect collection at Iowa State College, Ames, Iowa. A paragraph in a letter from W. M. Giffard to E. P. Van Duzee, dated January 12, 1928, reads as follows: "I think I wrote you before that the genotype, **P. marginatus** had been badly man-handled and repaired by some one before it was sent me and I had so informed Drake at the time. One elytra entirely gone and the other badly frayed—most legs broken off and the abdomen had been glued back onto the thorax of the insect—the head and thorax, however, were in good shape for study and if the genitalia has not already been damaged the abdomen can be freed and placed in the card cell together with the genital organs. The specimen would then be of far more value than it is now." In 1946, when Oman designated the above male lectotype, there was only the male genitalia mounted in a cardboard cell, left of this specimen. It is therefore upon this male genitalia that the identification of this species is based.

Structure: Basal segment of antennae about one-half as long as second; front twice as long as greatest width, slightly narrowed toward each end, carinae distinct; vertex slightly longer than wide, broadly rounded in front, carinae barely visible; veins of elytra scarcely visible, but little raised above membrane, not attaining hind margin; abdomen set with white hairs, less than their length apart; genital segment of male one-half as wide as greatest width of abdomen; when viewed laterally, processes on anal segment of male produced beyond posterior margin of genital segment, their apices curved inward, resting on genital segment below.

Color: General body color dark reddish brown, legs and antennae soiled yellow; apex of clypeus lighter than basal portion; elytra very slightly hyaline, reddish brown, veins concolorous with membrane, hind margin of elytra of males with narrow white band, which is wanting in females.

Genitalia: In lateral view pygofer of male more or less rectangular with large tooth on caudal margin; aedeagus widest at base, tapering to rounded apex with one slender process on dorsal margin just before apex about one-third length of shaft and a row of short teeth arising on dorsal margin near middle and winding to left side toward base; anal segment produced into pair of long slender processes, longer than basal portion of segment. In ventral view width of styles uniform until just before acutely pointed, overhanging apices; median pair of processes extending almost to tip of styles, sides subparallel, apices more or less truncate with inner margin more or less sharply extended; lateral processes of pygofer truncate apically, slightly longer than wide.

Lectotype male in Collection of Iowa State College.

Material studied: 75 specimens from the following states: Florida, Virginia, Kansas, Ohio, Michigan, Illinois and Manitoba, Canada.

A comparison of numerous males and females with the holotype female of **Pissonotus ater** Van Duzee and the male lectotype of **Pissonotus marginatus** Van Duzee proves them to be identical. **Pissonotus ater** Van Duzee is therefore placed as a synonym of **Pissonotus marginatus** Van Duzee.

Pissonotus speciosus Metcalf

Pissonotus speciosus Metcalf, C. L., Jour. Elisha Mitchell Soc., Vol. 38, p. 205, 1923.

An examination of the types of this species reveals it to be a synonym of **Delphacodes andromeda** Van Duzee 1909.

Pissonotus nigridorsum Metcalf

Pissonotus nigridorsum Metcalf, C. L., Jour. Elisha Mitchell Soc., Vol. 38, p. 206, 1923.

This species was not available for study but the original description and drawings in the above publication indicate this species is not a **Pissonotus.**

The authors wish to express their appreciation to Miss Addie Egbert for her help with the illustrations.

NEW GENERA AND SUBGENERA OF SATURNIIDAE (LEPIDOPTERA)

CHARLES D. MICHENER
University of Kansas, Lawrence.

In a recently published paper (Michener, 1949, Evolution, vol. 3, pp. 129-141) on the evolution of saturniid moths, use was made of a number of generic and subgeneric names which had not previously appeared in the literature. As it now seems probable that the larger work in which these names were to be published will be delayed for at least some months, it seems necessary to briefly diagnose these groups at the earliest opportunity in order to avoid possible confusion in the nomenclature. The present paper contains these diagnoses. Full descriptions, lists of included species, phylogenetic considerations, and other details will be presented in the larger paper mentioned above.

In spite of the numerous new categories, mostly in groups where the usual classification does not properly indicate the relationships, the proposed classification is in many ways conservative. For example, **Dysdaemonia, Titaea, Paradaemonia,** and **Arsenura** are all placed as subgenera of **Rhescyntis; Pseudohazis** is placed as a subgenus of **Hemileuca;** our **Calosaturnia** and **Agapema** are regarded as subgenera of the Palearctic **Saturnia;** the forms usually placed in **Saturnioides** and **Sagana** are regarded as congeneric with **Copaxa; Callosamia** and **Eupackardia** are regarded as weak subgenera of **Hyalophora** (=**Platysamia**); and **Telea** is considered a synonym of **Antheraea.**

I am much indebted to Mr. Frank Johnson of Griffin, Georgia, for his enthusiastic support of the saturniid studies. Thanks to his generosity, technical assistants have been available to make dissections and drawings which have aided greatly in the comparative morphological work upon which the classification is based.

Subfamily **Citheroniinae**

Genus **Citheronia** Hübner

Procitheronia new subgenus

Type species: **Citheronia fenestrata** Rothschild.

This subgenus differs from **Citheronia** proper in having broad, fenestrate wings, in having the male antennae pectinate nearly to the apices, and in having the antennae of the female quadridentate. The aedeagus of the male

is simple, tapering, neither compressed nor bifurcate and the vulva of the female is circular.

Citheronula new subgenus

Type species: **Citheronia armata** Rothschild.

This subgenus differs from **Citheronia** proper in having the fore tibiae shorter than the tarsi and each armed with an apical spine, in having a few long hairs on the epiphyses, and in having the aedeagus of the male simple, tapering, neither compressed nor bifurcate and the vulva of the female circular.

Genus **Syssphinx** Hübner

Bouvierina new subgenus

Type species: **Adelocephala högei** Druce.

This subgenus, which includes the bulk of the species of the genus, differs from **Syssphinx** proper by having the uncus of the male shorter than the ninth tergum and the harpe less than three times as long as broad and almost always with an inner spine. The female differs from the allied subgenus **Sphingicampa** by the simple antennae.

Genus **Adelocephala** Herrich-Schaeffer

Oiticicia new subgenus

Type species: **Adelocephala purpurascens** Schaus.

This subgenus differs from typical **Adelocephala** in the narrower antennal pectination of the male, in the presence of bristles on the antennae of the female, in the longitudinal median membranous division of the gnathos of the male, and in the shorter harpes of the male which are less than three times as long as broad.

Ceropoda new genus

Type: **Ceropoda johnsoni** new species.

This genus is related to **Giacomellia,** from which it differs in having the antennae of both sexes pectinate, those of the male pectinate nearly to their apices, the shafts in both sexes strongly carinate beneath and in having a single long spine arising from the apex of each front and middle tibia. The yellow and pink coloration is suggestive of certain **Psilopygida,** an otherwise very different genus.

Ceropoda johnsoni new species

This species differs from its nearest relatives, such as **Adelocephala (Giacomellia) bilineata** (Burmeister), not only in the morphological generic characters but also in the pink and yellow coloration and the direction of the lines on the forewings.

Male: Length of body 19 mm., forewings 20 mm. Vestiture of body rather pale pink, yellowish on the face and with some yellowish intermixed on dorsum of thorax, pink replaced by pale brown on dorsum of abdomen; vestiture of legs pink, that of femora largely whitish. Antennae pale brown. Upper surface of forewing yellow with a small round white spot at apex of discal cell, this spot surrounded by pink; post-median line pink, arising at wing apex and extending to a point somewhat basad of tornus; fringe pink. (In one paratype entire upper surface of forewing suffused with pink and area beyond postmedian line wholly pink). Upper surface of hind wing en-

tirely pink except for the fringe which is whitish. Under surface of forewing pale pink, yellowish toward apex; under surface of hind wing entirely pale pink.

Female: Length of body 21 mm., forewing 24 mm., coloration as in male but postmedian line of forewing more uniformly arcuate.

Type material: Holotype male, allotype female and two male paratypes from Matto Grosso, Brazil, from the collection of Mr. Frank Johnson. The holotype and allotype will be placed in the collection of the American Museum of Natural History, New York City.

Psilopygoides new genus

Type species: **Adelocephala oda** Schaus.

This genus has the outer and posterior margins of the forewings of the male (female unknown) evenly rounded as in **Almeidella** and **Psilopygida.** It differs from these genera and from all others having cell 1A of the forewing open in having three-segmented labial palpi. The very short ninth tergum of the male is also distinctive.

Psilopygida new genus

Type species: **Adelocephala crispula** Dognin.

Like **Almeidella,** this genus has the outer and posterior margins of the forewings evenly rounded in the male. It differs from that genus in having the male antennae pectinate beyond the middle, the ninth tergum unusually long and the uncus short and simple.

Genus **Adelowalkeria** Travassos

This genus is here used in a much broader sense than in the past, to include not merely the few species of **Adelowalkeria** proper but five other groups as indicated below:

Ceratesa new subgenus

Type species: **Adelocephala hemirhoda** Schaus.

In this subgenus a strong apical spine is present on each fore and middle tibia. In this respect it resembles **Ceropada,** from which it differs by the noncarinate antennae, among other characters. Genitalically **Ceratesa** resembles **Scolesa** in having a free anellus. The male genitalia are smaller and simpler than in any other **Adelowalkeria.**

Scolesa new subgenus

Type species: **Adelocephala totoma** Schaus.

This subgenus differs from the others, except **Ceratesa,** by the large free anellus in the male. It differs from **Ceratesa** by the absence of tibial spines. The female differs from **Ptiloscola** by the unbanded abdominal terga.

Megaceresa new subgenus

Type species: **Adelocephala pulchra** Bouvier.

The very broadly pectinate basal three-fourths of the flagellum of the male and the thickened flagellum of the female distinguish this subgenus from its closest relative, **Adelowalkeria** proper. A further distinctive character is the pedunculate dorsal process of the uncus of the male.

Ptiloscola new subgenus

Type species: **Adelocephala lilacina** Schaus.

This is a distinctive-looking group of gray or brown species, usually with

Subfamily **Hemileucinae**

Callodirphia new genus

Type species: **Heliconisa arpi** Schaus.

The sole species of this genus has always been included in **Dirphia** or one of the groups here considered a subgenus of **Dirphia.** It is very distinctive, however, and in many ways primitive. It differs from **Dirphia** by the presence of spines on the under sides of the tarsi, the freely articulated male harpes and the free anellus. It is unique among hemileucines in having the antennae of the female quadripectinate.

Travassosula new genus

Type species: **Adelocephala subfumata** Schaus.

This curious monobasic genus is based on a single species usually placed in the Citheroniinae. Travassos (after whom the genus is named) and May (1943. Bol. Mus. Nac. (Brazil), new series, Zool., No. 11, pp. 1-22) indicated that it did not belong in that subfamily. Distinctive generic characters include a notch or emargination in the front margin of the hind wing before the apex of vein $Sc+R_1$. The genitalia are somewhat suggestive of **Hemileuca,** from which **Travassosula** differs by the reduced vein 3A of the hind wings and the well developed arolia and pulvilli.

Adetomeris new genus

Type species: **Io erythrops** Blanchard.

This is the most distinctive of the **Automeris**-like genera. It has the iris of the eye spot of each hind wing red or orange as in **Gamelia, Hyperchiria,** and **Automerina,** but differs from these as well as **Automeris** by the freely articulated male harpes, free anellus, the presence of two subapical spurs on each hind tibia, and the presence of spines on the under surfaces of the tarsi.

Genus **Automeris** Hübner

Automerella new subgenus

Type species: **Automeris flexuosa** Felder.

This subgenus is closely related to **Automeris** proper from which it differs by the flattened and deeply bifid male uncus, the long inner spines of the harpes, the long apical bristles on the basal rami of the male antennae, the long lanceolate scales on the scutellum, and the produced anterior apical angles of the hind wings.

Automeroides new subgenus

Type species: **Automeris orneates** Druce.

This subgenus is closely related to the subgenus **Agliopsis** from which it differs in the broader wings, in having the proboscidial fossa longer than broad, and in having the uncus of the male bilobed.

Eubergioides new genus

Type species: **Dirphia bertha** Schaus.

This genus is closely related to **Automeris** in spite of its superficial resemblance to the subgenus **Eubergia** of **Hylesia.** The genitalia resemble those of **Automeris,** not **Hylesia.** The antennae of the female are more thickened than in **Automeris** and the eye spot of each hind wing is a mere ring enclos-

the abdomen banded. There is no free anellus in the male, a character which separates this subgenus from **Scolesa.** Each harpe has a basal ventral process, that of the right harpe much larger than that of the left.

Rachesa new subgenus

Type species: **Othorene adusta** Rothchild.

This subgenus, known only in the male, contains species superficially similar to some **Adelocephala,** subgenus **Oiticicia.** The antennae are unusually long, about as long as the thorax, and the male genitalia very distinctive, each harpe having two long slender spines arising from its upper basal angle and also with a broad, toothed, basal ventral lobe. Thus this subgenus differs from its relatives such as **Adelowalkeria** proper.

ing an area having the color of the ground of the wing, not differently colored as usual in **Automeris.**

Automerina new genus

Type species: **Hyperchiria caudatula** Felder.

This genus is similar to **Hyperchiria** from which it differs by the small, weakly bilobed harpes and the absence of the long spines of the anellus. The inner spine of each harpe, when present, is of the type occurring in **Automeris,** not that characteristic of **Hyperchiria.**

Automerula new subgenus

Type species: **Jo auletes** Herrich-Schaeffer.

This subgenus of **Automerina** can be distinguished from **Automerina** proper by the very short antennae, only half as long as the thorax, by the short labial palpi with the second and third segments fused, and by the presence of an inner spine on each harpe of the male.

Genus **Ormiscodes** Blanchard

This genus is here interpreted in a broad sense to include much of what is usually placed in **Dirphia** as well as **Meroleuca** and the following new groupings:

Dirphiella new subgenus

Type species: **Dirphiopsis albofasciata** Johnson and Michener.

This subgenus, known from a single species, differs from all others in having bipectinate rather than quadripectinate antennae in the male. It is probably most closely related to **Paradirphia,** with which it agrees in the carinate antennal shafts of the male. It differs from **Paradirphia** not only in antennal characters but in the absence of epiphyses in the male.

Xanthodirphia new subgenus

Type species: **Ormiscodes amarilla** Schaus.

This is another subgenus which, like **Paradirphia,** has the male antennal shafts carinate beneath. It differs from **Paradirphia** in the absence of subapical spurs on the hind tibiae, the absence of an inner spine on each harpe, and the largely yellow color.

Paradirphia new subgenus

Type species: **Phricodia coprea** Draudt.

In this subgenus the antennal shafts are carinate beneath and the harpes of the male are fused to the anellus and the ninth abdominal segment. In these respects **Paradirphia** resembles **Xanthodirphia** from which it differs

not only in the darker coloration but in the presence of a subapical hind tibial spur and an inner spine on each harpe.

Rhodirphia new subgenus

Type species: **Dirphia carminata** Schaus.

This subgenus, which may be recognized superficially by its deep red color, is remarkable for the presence of one to several strong ventral spines on the basal rami of the outer side of the distal half of each male antenna. Although the wing pattern is suggestive of **Paradirphia, Rhodirphia** differs from that subgenus strikingly in the noncarinate antennae, the absence of inner spines on the harpes and the absence of subapical spurs on the hind tibiae.

Meroleucoides new subgenus

Type species: **Dirphia flavosignata** Dognin.

This subgenus is closely related to the subgenus **Meroleuca** from which it differs in the presence of epiphyses in the male, of a subapical spur on each hind tibia, of abdominal color bands, and of terminal bristles on the basal rami of the male antennae.

Cerodirphia new genus

Type species: **Phricodia rubripes** Draudt.

This genus is related to **Ormiscodes.** It can be distinguished by the very long and coarse antennal bristles, there being one especially long dorsal bristle on each segment of the male. Most species can also be recognized by the narrow bands of white vestiture at the bases of the abdominal terga.

A NEW APHID FROM WASHINGTON

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Among the aphid material collected in the state of Washington by B. J. Landis and E. W. Davis of the U.S. Bureau of Entomology and Plant Quarantine, and sent to the senior writer for identification, was this interesting and apparently undescribed aphid. The material fits no genus or species with which the writers are acquainted.

Landisaphis n. gen.

Characters: Body broadly-oval to pear-shaped, vertex convex, antennal tubercles but slightly developed, antennae 6 or 5-jointed, approximately one-half length of body, abdomen bearing prominent dorsal and lateral tubercles on which flattened hairs are borne; cornicles swollen on distal one-half, vasiform.

Type: Landisaphis davisi Knowlton and Ma.

Taxonomy: Landisaphis resembles **Cavariella** Del Guercio in having prominent vertex, poorly developed antennal tubercles, and tendency for rugulose condition of body cuticula. The last dorsal tubercle resembles the supra-caudal tubercle in many alate **Cavariella,** but in **Landisaphis** this is only one of a series of tubercles; hairs on body, head, most of pendages and tubercles flattened to fan shaped on some body areas. It differs from **Capitophorus** Van der Goot in vertex exceeding antennal tubercles, in possessing prominent lateral tuberculate areas on abdomen, and having ocular tubercles well developed.

Landisaphis davisi n. sp.

Apterous vivipara: Color generally pale in cleared specimens; body .95 to 1.35 mm. long and .55 to .85 wide across abdomen; cuticula of head and much of body rugulose; width through eyes .29 to .35 mm.; antennal tubercles poorly developed, exceeded by prominent median protruberance armed with four distally widened hairs; rostrum not exceeding third coxae, rostrol IV + V slenderly obtuse and .08 to .10 mm. long, pale to dusky antennae pale to approximately middle of sub-terminal segment, dusky beyond, of rough, imbricated surface, without secondary sensoria, V or VI segmented, with strong tendency for III to fail to divide completely or partially; antennal III, irregular in length, usually .15 to .22 (.1 to .233 mm., extremes); IV, .069 to .11; V, .07 to .103; VI, .06 to .076 plus .095 to .121 mm.; abdomen with at least five pairs of lateral, broad tubercle-like areas on sides of segments, beginning just in front of cornicles, with an extra small and more rounded tubercle just before first larger, more glandular appearing pair; also mid-dorsal line of abdominal segments VI, VII, and VIII bearing a prominent tubercle, with a pair of such tubercles on sides of mid-dorsal line on segment V; each of the prominent thick abdominal tubercles armed with 2 short, flattened to spatula-like hairs, such as occur on vertex; wider hairs on abdomen only moderately abundant, varying from flattened to fan-shape to occasionally capitate, and also bearing some pointed hairs on ventral surface of abdomen; cornicles .165 to .225, of uneven surface, distinctly club-shaped, pale, to dusky on distal two-fifths, before well developed flangs; cauda pale to dusky .12 to .19 mm., upturned, constricted before base, usually with two pairs of lateral hairs on sides of distal half and one hair on dorsal surface.

Collection data: Aphids on the ten slides, including the holotype (73-H) were feeding on the underside of leaves of lambsquarter, **Chenopodium album** L., at Cowiche, Washington, May 21, 1947 by E. W. Davis. Type in the U.S. National Museum. Paratypes in the Utah Agricultural Experiment Station insect collection.

Taxonomy: Landisaphis davisi differs from **Hyalopterus atriplicis** (L.) in possessing shorter cauda than cornicles, and body being armed with flat or blunt hairs. The dorsal abdominal tubercles of **davisi** suggest those of **Capitophorus gregarius** Knlt., from which it differs in having shorter antennae and smaller general size, less development of antennal tubercles and less fan-shaped body hairs.

NEW SALDIDAE FROM THE WESTERN HEMISPHERE (HEMIPTERA)

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During the course of a taxonomic study of the Saldidae, under the direction of Doctor H. B. Hungerford, nine new species and one new subspecies have been discovered.

Pentacora signoretii yucatana n. subsp.
(Figures 1 and 2)

Size: Length 5.56 mm. to 6.31 mm. ♂; 6.22 mm. to 6.90 mm. ♀. Width of pronotum 2.02 mm. to 2.25 mm. ♂; 2.22 mm. to 2.55 mm. ♀.

Color: General color ivory with brown and black markings. Eyes yellow or ivory, often mottled with brown or black. Vertex black with a pair of yellow spots behind ocelli. Remainder of head yellow, excepting a median longitudinal dark band on gula. First and second antennal segments yellow above, red-brown beneath, third and fourth segments dark yellow to red-brown. Rostrum dark brown. Anterior lobe of pronotum black, with several yellow spots; posterior lobe black medially, ivory laterally, with dark spots near humeral angles. Scutellum black, marked with a lateral yellow spot on each side at end of basal half and with a lateral yellow spot on each side before apex. Clavus and corium brown, with several ivory spots of variable extent; embolium ivory, frequently discolored with brown at end of basal third, banded with brown or black at end of medial third; a brown or black spot at nodal furrow; membrane smoky-brown, a transverse yellow band at end of basal third, apices of areoles pale yellow. Venter of thorax ivory, mesosternum black. Venter of abdomen pale, each segment brown basally, fading to ivory apically. Genital capsule of male brown basally with its apex and terminal processes ivory. Coxae brown basally, ivory apically; other segments of legs ivory, often marked with brown apically. Spines of legs and of first antennal segment black.

Structural characteristics: General shape elongate oval. Clothed with short, golden pubescence and short, fine, black setae. A single row of short, coarse, black setae extends along lateral margins of pronotum and hemelytra. Width of head as compared to width of pronotum :: 63 : 100 ♂; 61 : 100 ♀. Apex of frons slightly elevated, frons depressed subapically. Frons with a distinct median longitudinal sulcus above clypeus. Vertex smooth behind ocelli. Rostrum usually extending to apex of hind coxae. Antennae slender, long; length of antenna as compared to length of hind tibia :: 112 : 100 ♂, 116 : 100 ♀; length of second segment as compared to width of head :: 128 : 100 ♂, 132 : 100 ♀. Antennal segmentation 1 : 2 : 3 : 4 :: 15 : 48 : 22 : 15 ♂; 15 : 49 : 21 : 15 ♀. Pronotum lustrous, minutely scabrous. Median length of posterior lobe as compared to median length of anterior lobe :: 50 : 100 ♂; 50 : 100 ♀. Anterior lobe moderately elevated, deeply foveate near center, transversely impressed across fovea. Posterior lobe moderately explanate on each side of anterior lobe; lateral margins straight or slightly convex. Scutellum minutely scabrous, lustrous, Hemelytra, ex-

cept membrane, minutely scabrous, lustrous. Female with a submarginal ridge on embolium, the ridge terminating abruptly, distance from apex of ridge to apex of embolium equal to little more than half of width of head. Relative position of apex of ridge is indicated in male by anterior edge of a black band across embolium beyond end of medial third of embolium. Venter of last abdominal segment of female notched at apex. Length of posterior tibia as compared to width of head :: 241 : 100 ♂; 232 : 100 ♀. Brachypterous form is not known.

Comparative notes: This subspecies can be distinguished from **Pentacora signoretii signoretii** (Guérin-Ménéville) by the lesser distance between the apex of the submarginal ridge on the embolium of the female and the apex of the embolium. In **P. signoretii yucatana** the distance is only slightly more than one-half the width of the head; in the typical subspecies it is nearly or quite equal to the width of the head. In the males of both subspecies the relative position of the apex of the ridge is marked by the anterior edge of a dark band across the embolium near the end of the medial third of the embolium. **P. signoretii yucatana** is smaller than the usual specimens of **P. signoretii signoretii** (Guérin) and is usually paler.

Location of types: Holotype, Progreso, Yucatan, Mexico, Aug. 27, 1936, H. D. Thomas, ♂; **allotype,** Progreso, Yucatan, Mexico, Aug. 27, 1936, H. D. Thomas, ♀; **paratypes,** Progreso, Yucatan, Mexico, Aug. 27, 1936, H. D. Thomas, 13 ♂♂ and 6 ♀♀.

The type series is in the Francis Huntington Snow Entomological Collections.

Data on distribution: Known only from the type series.

Salda beameri n. sp.

(Figures 3 and 4)

Size: Length 2.70 mm. ♂; 2.91 mm. ♀. Width of pronotum 1.04 mm. ♂; 1.04 mm. ♀.

Color: General color black, marked with brown, yellow and white. Eyes pale brown. Head black; clypeus, labrum and rostrum yellow-brown; a brown spot on each side of ocelli. First and second antennal segments yellow-brown, third and fourth segments red-brown. Pronotum, scutellum and venter of thorax black. Clavus black with a yellow spot on middle opposite apex of scutellum, red-brown behind yellow spot, apex pruinose. Corium red-brown, base and veins black, with a white spot near lateral margin at middle and a yellow-white spot on lateral margin at end of basal fourth, pruinose along claval suture. Embolium yellow-white with a transverse dark band at end of medial third and at apex, these bands red-brown basally, black apically. Membrane dark brown, pruinose basally and laterally, with a yellow spot at apex of second areole. Abdominal sterna black, narrowly margined with brown posteriorly; last abdominal sternum of female brown-black basally, produced portion yellow-brown. Genital capsule of male brown. Coxae black or brown, topped with yellow; trochanters yellow; femora yellow basally, brown apically; tibiae yellow-brown; tarsi yellow. Spines of legs black.

Structural characteristics: General shape obovate. Dorsal surfaces clothed with scattered, long, erect, stiff, black setae; venter, legs and antennae

clothed with fine, recumbent, golden pubescence. Width of head as compared to width of pronotum :: 79 : 100 ♂; 84 : 100 ♀. Frons polished, obsoletely transversely rugulose, not medially sulcate; apex of frons not raised into a carinate ridge. Vertex polished, smooth. Ocelli separated by approximately the width of an ocellus. Rostrum usually extending to apex of hind coxae. Antennae long, third and fourth segments swollen, fusiform; length of antennae as compared to length of hind tibia :: 136 : 100 ♂, 134 : 100 ♀; length of second antennal segment as compared to width of head :: 63 : 100 ♂, 58 : 100 ♀. Antennal segmentation 1 : 2 : 3 : 4 :: 19 : 27 : 26 : 28 ♂; 19 : 27 : 26 : 28 ♀. Pronotum polished, smooth; median length of posterior lobe as compared to median length of anterior lobe :: 83 : 100 ♂; 73 : 100 ♀. Anterior lobe strongly elevated, sulcus separating it from posterior lobe moderately incised, distinctly punctate. Median fovea located on anterior third of anterior lobe. Posterior lobe narrowly explanate along lateral margins; lateral margins straight, strongly convergent. Scutellum polished, smooth, swollen, depressed at end of basal half. Clavus, corium and medial half of transverse dark bands of embolium opaque; remainder of embolium and membrane lustrous. Sutures of hemelytra distinct; veins of carium obsolete. their position marked by the black coloration; veins of membrane distinct except those surrounding fourth areole. Areoles of membrane forming an evenly gradate series, except fourth areole which is reduced to an oval beside the base of the third areole. Posterior margin of last abdominal sternum of female evenly rounded; sternum moderately produced, approximately three times as long as preceding sternum. Length of posterior tibia as compared to width of head :: 136 : 100 ♂; 134 : 100 ♀. Brachypterous forms are not known.

Comparative notes: Most closely resembles **S. polita** Uhler in general facies. It can be distinguished from that species by its smaller size, antennal segmentation, hemelytral pattern, inflated scutellum and by the terminal processes of the genital capsule of the male. **S. beameri** bears a general resemblance to **Saldoida slossoni** Osborn in color and antennal structure, but lacks the prominent conical processes of the pronotum present in that species.

Location of types: Holotype: Las Cruces, New Mexico, April 30, 1948; L. D. Beamer, ♀; **allotype,** Las Cruces, New Mexico, April 30, 1948, R. H. Beamer, ♂.

The holotype and allotype are in the Francis Huntington Snow Entomological Collections. Named for Doctor R. H. Beamer whose extensive collecting trips have provided a large number of the Saldidae in the Snow Collections.

Data on distribution: Known only from the type series.

Salda dentulata n. sp.

(Figures 5 and 6)

Size: Length 3.00 mm. to 3.16 mm. ♂; 3.19 mm. to 3.49 mm. ♀. Width of pronotum 1.17 mm. to 1.17 mm. ♂; 1.18 mm. to 1:34 mm. ♀.

Color: General color black anteriorly, brown spotted with white posteriorly. Eyes dark brown to red-brown. Head black excepting bucculae, apex of frons (occasionally the apical half), clypeus and labrum which are yellow of yellow-brown. A yellow-brown spot located next to eyes opposite ocelli. Rostrum yellow-brown. First antennal segment yellow above, yellow-brown

beneath; second segment yellow-brown; third and fourth segments red-brown. Pronotum, scutellum and venter of thorax black, episternal plates before anterior and middle coxae margined with yellow-brown. Clavus brown-black with a white spot on the middle near apex. Corium brown with large white spots on lateral margin at end of basal fourth and at middle and with blue-white spots near apex, one near lateral margin, another near the middle. Embolium yellow, brown on inner margin on basal fourth and with brown spots on middle and on medial margin at middle and on the apical third, a blue-white spot is located in the inner apical angle. Membrane pale, yellow-brown, veins darker brown, infumed along veins and in transverse bands across areoles at ends of basal and median thirds of areoles; these bands do not attain edges of membrane. Abdominal sterna brown, narrowly margined posteriorly with yellow at sides; last abdominal sternum of female brown, produced portion yellow-white. Genital capsule of male brown. Coxae brown, tipped with yellow; trochanters yellow; femora yellow basally, yellow-brown apically; tibiae yellow, narrowly brown basally and apically; tarsi yellow. Spines of legs brown.

Structural characteristics: General shape oval. Clothed with fine, recumbent pubescence, golden above, silvery beneath. Width of head as compared to width of pronotum :: 75 : 100 ♂; 75 : 100 ♀. Frons and vertex lustrous, minutely scabrous. Apex of frons raised into a carinate ridge which is sulcate in middle and moderately upturned at ends. Frons distinctly sulcate along median line. Ocelli separated by less than the width of an ocellus. Rostrum usually extending to apex of hind coxae. Antennae long, slender, third segment nearly cyclindrical; length of antennae as compared to length of hind tibia :: 110 : 100 ♂, 117 : 100 ♀; length of second antennal segment as compared to width of head :: 60 : 100 ♂, 62 : 100 ♀. Antennal segmentation 1 : 2 : 3 : 4 :: 15 : 34 : 25 : 26 ♂; 16 : 34 : 25 : 25 ♀. Pronotum lustrous, minutely scabrous; median length of posterior lobe as compared to median length of anterior lobe :: 77 : 100 ♂, 84 : 100 ♀. Anterior lobe moderately elevated, sulcus separating it from posterior lobe moderately incised; median fovea located before middle. Posterior lobe narrowly explanate, lateral margins straight or slightly concavely curved, strongly convergent. Scutellum lustrous, minutely scabrous, posterior half minutely transversely rugulose. Clavus opaque, remainder of the hemelytron lustrous. Sutures of hemelytra distinct; corial veins indistinct, nevertheless visible; veins of membrane distinct, areoles forming an evenly gradate series. Posterior margin of last abdominal sternum of female evenly rounded, sternum moderately produced, approximately four times as long as preceding sternum. Clasper armed on inside of swollen portion with a short, ventrally directed tooth. Length of posterior tibia as compared to width of head :: 159 : 100 ♂; 158 : 100 ♀. Brachypterous forms are not known.

Comparative notes: Closely related to **S. sulcata** (Barber) and **S. sectilis** new species, from which it can be distinguished by the color pattern of the hemelytra and the shape of the terminal processes of the genital capsule of the male. The evenly rounded apex of the genital capsule of the male and the tooth on the clasper will further distinguish this species from **S. sulcata.**

The third tarsal segment of all legs is yellow in this species and brown in **S. sectilis.**

Location of types: Holotype: Telescope Estate (Windward side), Grenada, B.W.I., H. H. Smith, ♂; **allotype,** Mount Gay Estate (Leeward side), Grenada, B.W.I., H. H. Smith, ♀; **paratypes,** Telescope Estate (Windward side), Grenada, B.W.I., H. H. Smith, 1 ♂, 1 ♀; Mount Gay Estate (Leeward side), Grenada, B.W.I., H. H. Smith, 1 ♂; Grenada, B.W.I., H. H. Smith, 1 ♀; Grenada, B.W.I., 1 ♂.

Uhler (Proc. Zool. Soc. London 1894, p. 212, 1894) recorded the type series under the name **Salda humilis.** He said " . . . specimens of this species were found on August 15 on the margins of pools of water. Two different sizes occur, the one normal as in the Eastern U.S. and Cuba, the other longer and with a somewhat narrower abdomen." Barber (Sci. Surv. Porto Rico, p. 417, 1939) called attention to the presence of a new species in this series, saying, " . . . Uhler reported **M. humilis** from Grenada. Of the 8 Grenada specimens from the Uhler Collection in the U.S. National Museum, only one is the true **M. humilis,** the others represent an undescribed species quite different from **M. sulcata.**" Examination of the eight specimens mentioned by Barber confirms his statement. One specimen, correctly determined as **Micracanthia humilis** by Barber is present among them and may be readily distinguished from the others, which constitute the type series of **S. dentulata.** The holotype, allotype and three paratypes are in the United States National Museum, one male and one female paratype are in the Francis Huntington Snow Entomological Collections.

Data on distribution: Known only from the type series.

Salda dewsi n. sp.

(Figures 7 and 8)

Size: Length 3.61 mm. to 3.95 mm. ♂; 4.21 mm. to 4.40 mm. ♀. Width of pronotum 1.32 to 1.40 mm. ♂; 1.50 mm. to 1.56 mm. ♀.

Color: General color black, margined with yellow. Eyes light brown to dark brown. Venter of head black, vertex black with a yellow spot on each side diagonally behind each ocellus; frons black basally and on each side of median sulcus, yellow apically and next to eyes. Clypeus yellow, labrum yellow, margined with brown. Rostrum brown. First antennal segment red-brown beneath, yellow above; second, third and fourth segments red-brown. Pronotum black, lateral margins black basally and apically, median third yellow. Scutellum black. Venter of thorax black, lateral margins of pronotum yellow beneath, episternal plates before anterior and middle coxae broadly margined with white. Hemelytra black with yellow and pruinose areas. Clavus black with a yellow spot at humeral angle and a yellow-white spot on middle near apex. Corium black, inner half pruinose, an oval yellow spot on lateral margin at end of basal half, apex narrowly yellow margined. Embolium black, lateral margin yellow, an elongate white spot on inner margin at end of basal third and an elongate median white spot on apical third, this spot contiguous apically with the yellow margin. Membrane brown, veins infumed with darker brown. Abdominal sterna yellow to brown; last abdominal sternum of female brown, produced portion

white. Genital capsule of male brown. Coxae brown, often tipped with yellow; trochanters yellow; femora yellow basally, brown apically; tibiae yellow-brown or yellow, tipped with brown; second tarsal segment yellow, third tarsal segment brown; spines of legs brown.

Structural characteristics: General shape elongate oval, tapering posteriorly. Venter, legs and antennae clothed with fine, recumbent, golden pubescence; third and fourth segments of antennae with a few erect setae. Head, pronotum, scutellum and hemelytra clothed with short, erect, stiff, black setae. Width of head as compared to width of pronotum :: 67 : 100 ♂; 61 : 100 ♀. Frons and vertex lustrous, minutely scabrous. Apex of frons raised into a carinate ridge which curves evenly upward to eyes and which is sulcate in middle. Frons deeply sulcate along median line, each side forming a definite lobe. Ocelli separated by slightly less than the width of an ocellus. Rostrum usually extending to middle of hind coxae. Antennae long, slender, third segment nearly cylindrical; length of antenna as compared to length of hind tibia :: 109 : 100 ♂, 109 : 100 ♀; length of second antennal segment as compared to width of head :: 70 : 100 ♂, 73 : 100 ♀. Antennal segmentation 1 : 2 : 3 : 4 :: 16 : 32 : 26 : 26 ♂; 16 : 32 : 26 : 26 ♀. Pronotum lustrous, minutely scabrous; median length of posterior lobe as compared to median length of anterior lobe :: 80 : 100 ♂, 80 : 100 ♀. Anterior lobe moderately elevated, sulcus separating it from posterior lobe deeply incised; median fovea located at end of anterior third, anterior lobe transversely depressed across median fovea and obsoletely punctately depressed on each side of median fovea. Posterior lobe narrowly explanate, lateral margins straight or slightly convexly curved, distinctly sulcate along inner edge of yellow markings of lateral margins. Scutellum lustrous, minutely scabrous, posterior half minutely, transversely rugulose. Clavus opaque, corium lustrous, embolium lustrous excepting black areas which are opaque. Sutures of hemelytra distinct. Corial veins indistinct, nevertheless visible. Veins of membrane distinct, areoles forming an evenly gradate series. Posterior margin of last abdominal sternum of female not evenly rounded, emarginate on each side of center, sternum distinctly produced, approximately three times as long as preceding sternum. Length of posterior tibia as compared to width of head :: 202 : 100 ♂; 204 : 100 ♀. Brachypterous forms are not known.

Comparative notes: Most closely resembles **S. abdominalis** Champion. The more elongate shape, the color pattern of the hemelytra, the erect setae of the dorsal surfaces distinguish it from **S. abdominalis. S. ventralis** Stål can be distinguished from **S. dewsi** by the color pattern of the hemelytra and by the pale band around the middle of the fourth antennal segment, as well as by the recumbent pubescence on the dorsal surfaces. The terminal processes of the male genital capsule of **S. dewsi** are distinctive.

Location of types: Holotype, San Jose, Costa Rica, June and July 1931, Heinrich Schmidt, ♂; **allotype,** San Jose, Costa Rica, June and July 1931, Heinrich Schmidt, ♀; **paratypes,** San Jose, Costa Rica, June and July, 1931, Heinrich Schmidt, 22 ♂♂, 27 ♀♀; San Jose, Costa Rica, Purchased 1932, Heinrich Schmidt, 2 ♂♂, 2 ♀♀; Rio Virilla, Costa Rica, Dec. 20, 1931, Heinrich Schmidt, 6 ♂♂, 4 ♀♀; Carimechi, Rio Mayo, Chihuahua, Mexico,

Dec. 12, 1934, H. S. Gentry, 1 ♀; Temescaltepec, Mexico, Mexico, June 1-2, 1933, H. E. Hinton and R. L. Usinger, 1 ♀ (Calif. Acad. Sci.); Cuernavaca, Morelos, Mexico, May 1945, N. L. H. Krauss, 1 ♀ (U. S. N. M.); Cordoba, Vera Cruz, Mexico, April 1, 1908, Fred K. Knab, 1 ♂, 1 ♀ (U. S. N. M.).

The holotype, allotype and those paratypes not specifically listed from other museums are in the Francis Huntington Snow Entomological Collections. The paratypes marked Calif. Acad. Sci. and U. S. N. M. above are, respectively, in the collections of the California Academy of Sciences and of the United States National Museum. This species was first recognized as new by Samuel C. Dews and a description was written by him in "The Saldidae of the Western Hemisphere in the Snow Entomological Collections," an unpublished manuscript on file in the library of the University of Kansas.

Data on distribution: Known only from the type series.

Salda hispida n. sp.

Size: Length 5.03 mm. to 5.50 mm. ♀. Width of pronotum 1.60 mm. to 1.90 mm. ♀.

Color: General color black. Head black with a yellow spot on each side of ocelli; clypeus and middle of labrum yellow. Rostrum yellow above, brown beneath. First antennal segment yellow above, brown beneath; second, third and fourth segments red-brown. Pronotum, scutellum and venter of thorax black. Clavus black, inner three-fourths pruinose, excepting area along commissure and apex. Corium black, with a yellow or pruinose spot on lateral margin at end of basal fourth and on middle near apex. Embolium black, with a yellow spot on lateral margin at middle of apical third. Membrane brown, veins dark brown, one or two dark spots within each areole. Abdominal sterna, including last abdominal sternum of female, dark brown, narrowly margined with yellow posteriorly. Coxae black, tipped with yellow; trochanters yellow; femora brown, variously spotted with darker brown, yellow at apex; tibiae yellow or yellow-brown, dark brown at base and apex and broadly ringed with brown on middle; second tarsal segment yellow; third segment brown. Spines of legs black.

Structural characteristics: General shape broadly oval. Clothed with long, recumbent, golden pubescence above and on venter of thorax; with short, recumbent, pubescence on frons and third and fourth antennal segments; with long, erect, golden pubescence on venter of abdomen. Dorsal surfaces, excepting membrane, antennae and tibiae clothed with long, stiff, erect, dark or golden setae; eyes with scattered, short, erect, dark setae. Width of head as compared to width of pronotum :: 70 : 100 ♀. Frons and vertex lustrous, scabrous; apex of frons not raised into a carinate ridge; frons obsoletely sulcate along median line between eyes. Ocelli separated by less than the width of an ocellus. Rostrum extending to apex of hind coxae. Antennae long, slender, third segment fusiform; length of antenna as compared to length of hind tibia :: 110 : 100 ♀; length of second antennal segment as compared to width of head :: 65 : 100 ♀. Antennal segmentation 1 : 2 : 3 : 4 :: 17 : 34 : 23 : 26 ♀. Pronotum polished, obsoletely, minutely scabrous; median length of posterior lobe as compared to median length of anterior lobe :: 67

: 100 ♀. Anterior lobe moderately elevated, sulci before and behind it moderately incised, coarsely punctate, posterior sulcus distinctly anteriorly sinuated in middle. Median fovea located before middle of anterior lobe; anterior lobe slightly depressed along median line behind median fovea; obsoletely, punctately depressed on each side of median fovea. Posterior lobe narrowly, distinctly explanate along lateral margins and on each side of anterior lobe; lateral margins straight, moderately convergent. Scutellum polished, obsoletely, minutely rugulose. Clavus opaque on pruinose area, remainder of hemelytron polished and (excepting membrane) minutely scabrous. Sutures of hemelytra distinct; corial veins indistinct, veins of membrane distinct. Areoles of membrane forming an evenly gradate series. Posterior margin of last abdominal sternum of female truncate, slightly sinuated; slightly more than twice as long as preceding sternum. Length of posterior tibia as compared to width of head :: 172 : 100 ♀. Brachypterous forms are not known.

Comparative notes: Most closely resembles **S. sulcicollis** Champion from which it can be distinguished by the prominent, erect setae of the eyes and hind tibiae. The details of the color of the legs and antennae differ from those of **S. sulcicollis** and the anterior lobe of the pronotum of **S. hispida** is not so deeply depressed on the median line behind the median fovea.

Location of types: Holotype, Real de Arriba, Temescaltepec, Mexico, Mexico, May 23, 1933, H. E. Hinton and R. L. Usinger, ♀; **paratypes,** Real de Arriba, Temescaltepec, Mexico, Mexico, May 22, 1933, R. L. Usinger, ♀; Amecameca, Mexico, Mexico, March 3, 1928, received from Dr. Dampf, 1932, ♀.

The left antenna is missing from the holotype. The holotype is in the collection of R. L. Usinger; the paratypes are in the Francis Huntington Snow Entomological Collections.

Data on distribution: Known only from the type series.

Salda hungerfordi n. sp.
(Figures 9 and 10)

Size: (Brachypterous form): Length 2.27 mm. to 2.66 mm. ♂; 2.83 mm. to 3.00 mm. ♀. Width of pronotum 0.86 mm. to 1.02 mm. ♂; 0.98 mm. to 1.05 mm. ♀. **(Macropterous form):** Length 3.37 mm. ♀. Width of pronotum 0.85 mm. ♀.

Color: General color black bordered with white. Eyes pale brown to dark brown. Head black with a yellow spot on each side of ocelli. Apex of frons yellow or brown, yellow next to eyes; clypeus and labrum yellow or yellow-brown; bucculae yellow-brown. First antennal segment yellow-brown, second segment pale brown, third and fourth segments red-brown. Rostrum yellow to yellow-brown. Pronotum, scutellum and venter of thorax black. Clavus black with a yellow spot near angle at anterior end of commissure, base pruinose. Corium black, pruinose along basal half of lateral margin and along claval suture (on faded specimens pruinose markings are not apparent); often a yellow-white spot on lateral margin at end of basal fourth. Embolium yellow-brown or yellow-white with a black, triangular spot on inner half behind middle of length of embolium; a white spot is located im-

mediately posterior to the black triangle; the yellow-brown or yellow-white area is often infuscated with an obscure pattern. Nodal furrow yellow to dark brown. Membrane yellow-brown, inner edge darker. Abdominal sterna yellow to brown, last abdominal sternum of female brown basally, produced portion yellow-brown. Genital capsule of male brown. Coxae black or brown, tipped with yellow; trochanters yellow; femora yellow basally, yellow-brown apically; tibiae yellow, tipped with brown and often infuscated on middle; tarsi yellow, tipped with brown. Spines of legs brown.

Structural characteristics: (Brachypterous form): General shape obovate. Clothed with fine, recumbent, golden pubescence above and on abdomen and with silvery pubescence on venter of thorax. Width of head as compared to width of pronotum :: 89 : 100 ♂; 81 : 100 ♀. Frons and vertex lustrous, minutely scabrous. Apex of frons raised into a straight, carinate ridge which is sulcate at middle and moderately upturned at ends on male, obsolete at middle on female. Frons convex, not sulcate on median line. Ocelli separated by approximately the width of an ocellus. Rostrum usually extending to apex of hind coxae. Antennae long, slender, third segment nearly cyclindrical; length of antenna as compared to length of hind tibia :: 136 : 100 ♂, 136 : 100 ♀; length of second antennal segment as compared to width of head :: 49 : 100 ♂, 52 : 100 ♀. Antennal segmentation 1 : 2 : 3 : 4 :: 18 : 24 : 29 : 29 ♂; 18 : 26 : 28 : 28 ♀. Pronotum lustrous, minutely scabrous; median length of posterior lobe as compared to median length of anterior lobe :: 65 : 100 ♂, 60 : 100 ♀. Anterior lobe strongly elevated, sulcus separating it from posterior lobe moderately incised; median fovea located at end of anterior third of anterior lobe. Posterior lobe not explanate along lateral margins; lateral margins slightly concavely curved, strongly convergent. Scutellum lustrous; apical two-thirds transversely rugulose, slightly inflated; basal third minutely scabrous. Clavus, corium and black of embolium opaque; membrane and remainder of embolium lustrous. Claval suture and suture between corium and embolium distinct; nodal furrow obsolete. Veins of corium obsolete; veins of membrane distinct, excepting outer marginal vein of fourth areole. Membrane reduced, narrow, fourth areole coriaceous, not distinguished from embolium; the three distinct areoles form an evenly gradate series. Posterior margin of last abdominal sternum of female evenly rounded; sternum moderately produced, approximately two and one-half times as long as preceding sternum. Length of posterior tibia as compared to width of head :: 147 : 100 ♂; 148 : 100 ♀. **(Macropterous form):** General shape obovate. Width of head as compared to width of pronotum :: 80 : 100 ♀; length of second antennal segment as compared to width of head :: 54 : 100 ♀. Length of first antennal segment as compared to length of second antennal segment :: 67 : 100 ♀, third and fourth segments missing in the specimen at hand. Median length of posterior lobe of pronotum as compared to median length of anterior lobe of pronotum :: 85 : 100 ♀. Anterior lobe more strongly elevated than in brachypterous form. Apex of scutellum strongly inflated, polished, obsoletely, minutely, transversely rugulose. Membrane broader than in brachypterous form, fourth areole more distinct. Hind wings plainly visible, extending nearly to apex of hemelytra. Length of hind tibia as com-

pared to width of head :: 159 : 100 ♀. Identical with brachypterous form in other features.

Comparative notes: Most closely resembles **S. pumila** (Blatchley) from which it can be distinguished by the more strongly elevated anterior lobe of the pronotum, which is not depressed behind the median fovea, by the inflated apical portion of the scutellum and by the terminal processes of the male genital capsule. The obovate shape of both the brachypterous and macropterous forms differ from the posteriorly tapered shape of **S. pumila.**

Location of types: Holotype, Coldspring Harbor, Long Island, July 30, 1920, J. R. de la Torre-Bueno, brachypterous ♂; **allotype,** Rye Beach, New York, July 17, 1909, brachypterous ♀; **paratypes,** Coldspring Harbor, Long Island, July 30, 1920, J. R. de la Torre-Bueno, 4 brachypterous ♂♂, 3 brachypterous ♀♀. **Morphoholotype:** Lower Matecumba Key, Florida, March 14, 1947, L. D. Beamer, macropterous ♀.

The type series is in the Francis Huntington Snow Entomological Collections. The holotype, allotype and paratypes are from the J. R. de la Torre-Bueno Collection in the Snow Collections.

Named for Doctor H. B. Hungerford whose long experience in the study of the aquatic and semiaquatic Hemiptera has been of great assistance to the writer in the study of the Saldidae.

Date on distribution: Known only from the type series.

Salda laviniae n. sp.

(Figures 11 and 12)

Size: Length 3.82 mm. to 4.57 mm. ♂; 4.55 to 4.90 mm. ♀. Width of pronotum 1.42 mm. to 1.62 mm. ♂; 1.76 mm. to 1.80 mm. ♀.

Color: General color black; hemelytra yellow, marked with black and brown. Head black, with a yellow spot on each side of ocelli, raised apex of frons, clypeus and middle of labrum yellow. Eyes pale brown to dark brown. Rostrum dark brown. First antennal segment dark brown beneath, yellow above and at apex; second segment red-brown, its apical fourth yellow; third and fourth segments dark brown. Pronotum and scutellum black; venter of thorax black, episternal plates before anterior coxae often narrowly margined with yellow. Clavus black, with an elongate, triangular white spot opposite commissure. Corium yellow, black basally, infuscated on disc and along veins on apical third. Embolium yellow, base black, with a transverse, dark brown band at end of medial third. Nodal furrow brown. Membrane yellow-white, infuscated at base and within each areole. In darkest forms hemelytra (excepting membrane) are black with a yellow spot near apex of clavus, on lateral margin of corium at middle and at end of basal fourth and on middle of embolium near apex. Abdominal sterna dark brown, narrowly margined with yellow posteriorly; last abdominal sternum of female dark brown basally, produced portion yellow-white. Genital capsule of male dark brown. Coxae black or brown, tipped with yellow; trochanters yellow or dark brown; femora yellow, frequently black above and beneath and on posterior edge; tibiae yellow to yellow-brown, infuscated basally, tipped with brown; tarsi yellow tipped with brown. Spines of legs and first antennal segment black.

Structural characteristics: General shape elongate-oval. Clothed above

with dense pile of long, erect, stiff, dark setae; with fine, silvery pubescence beneath; legs and antennae clothed with fine, golden pubescence. Width of head as compared to width of pronotum :: 72 : 100 ♂; 64 : 100 ♀. Frons lustrous, minutely scabrous; apex of frons raised into a swollen ridge which is sulcate at middle; frons not medially sulcate. Vertex polished, smooth. Ocelli separated by approximately the width of an ocellus. Rostrum usually extending to middle of hind coxae. Antennae long, slender, third segment nearly cylindrical; length of antenna as compared to length of hind tibia :: 111 : 100 ♂, 104 : 100 ♀; length of second antennal segment as compared to width of head :: 82 : 100 ♂, 86 : 100 ♀. Antennal segmentation 1 : 2 : 3 : 4 :: 16 : 37 : 25 : 22 ♂; 18 : 40 : 22 : 20 ♀. Pronotum polished, smooth; median length of posterior lobe as compared to median length of anterior lobe :: 60 : 100 ♂, 67 : 100 ♀. Anterior lobe moderately elevated, sulcus behind it moderately incised; median fovea located at end of basal third of anterior lobe; anterior lobe obsoletely, punctately depressed on each side of median fovea. Posterior lobe distinctly explanate along lateral margins and on each side of anterior lobe; lateral margins straight, strongly convergent. Scutellum polished, smooth. Clavus opaque; remainder of hemelytron lustrous. Veins and sutures of hemelytra distinct. Areoles of membrane forming an evenly gradate series. Posterior margin of last abdominal sternum of female rounded; sternum moderately produced, approximately two and one-half times as long as preceding sternum. Length of posterior tibia as compared to width of head :: 198 : 100 ♂; 207 : 100 ♀. Brachypterous forms are not known.

Comparative notes: Most closely resembles **S. comata** Champion and **S. comatula** (Parshley) from which it can be distinguished by the greater length of the second antennal segment and the straight lateral margins of the pronotum. It is more elongate than these species, the apex of the frons is more greatly swollen and the sides of the pronotum are more directly convergent. It lacks the erect setae of the second antennal segment and of the hind tibia found in **S. comatula.** It can be distinguished from **S. pallipes** (F.) by the pilose hemelytra.

Location of types: Holotype, Big Bend Park Hot Springs, Texas, April 11, 1949, C. D. Michener and R. H. Beamer, ♂; **allotype,** Big Bend Park Hot Springs, Texas, April 11, 1949, C. D. Michener and R. H. Beamer, ♀; **paratypes,** Big Bend Park Hot Springs, Texas, April 11, 1949, C. D. Michener and R. H. Beamer, 3 ♂♂ and 4 ♀♀; Grand Junction, Colorado, June 14, 1927, J. M. Aldrich, 1 ♀, (U. S. N. M.); Palisades, Colorado, Aug. 16, 1936, M. B. Jackson, 1 ♀; Arizona, Collection W. H. Ashmead, 1 ♂ (U. S. N. M.); Jemez Springs, New Mexico, July 1, 1941, R. H. Beamer, 2 ♀♀; Bluff, Utah, Aug. 30, 1942, G. F. Knowlton, 1 ♂ (U. S. N. M.).

The holotype and allotype are in the Francis Huntington Snow Entomological Collections; the paratypes are in the Snow Collections and in the collections of the United States National Museum. Named for the writer's wife, Mrs. Lavinia Richards Hodgden, whose assistance has been invaluable in the preparation of bibliographies and manuscripts concerning the Saldidae.

Data on distribution: Known only from the type series.

Salda sectilis n. sp.
(Figures 13 and 14)

Size: Length 2.90 mm. to 3.27 mm. ♂; 3.39 mm. to 3.45 mm. ♀. Width of pronotum 1.06 mm. to 1.16 mm. ♂; 1.18 mm. to 1.18 mm. ♀.

Color: General color black marked with yellow and brown. Eyes dark brown. Head black excepting yellow apex of bucculae and a yellow spot on each side next to eyes opposite ocelli. Clypeus, labrum and apex of frons yellow. First antennal segment yellow-brown, remaining segments red-brown. Rostrum yellow or yellow-brown. Pronotum, scutellum and venter of thorax black, episternal plates before anterior and middle coxae margined with yellow-brown. Clavus black, with a small yellow streak at humeral angle and with a yellow spot on middle near apex. Corium brown-black with a yellow spot near lateral margin at end of basal fourth, at middle, and with a small yellow spot near middle at apex; colors of the corium blended, not forming definite patterns. Embolium yellow with a broad, transverse, black band on middle of apical half, brown streaks occur before and behind band, lateral margin brown at end of this band; a large white spot is located near inner margin before and behind dark band. Membrane yellow-brown, veins dark brown, infumed brown bands traverse membrane at end of basal third and at middle; these bands do not attain edges of membrane. Abdominal sterna brown, narrowly margined with yellow apically; last abdominal sternum of female brown, produced portion yellow. Genital capsule of male brown. Coxae brown, tipped with yellow; trochanters yellow; femora yellow basally, yellow-brown apically; tibiae yellow, narrowly brown basally and apically, often infuscated beyond middle; second tarsal segment yellow, third segment brown. Spines of legs brown.

Structural characteristics: General shape oval, tapering posteriorly. Clothed with fine, recumbent pubescence, golden above, silvery beneath. Width of head as compared to width of pronotum :: 77 : 100 ♂; 83 : 100 ♀. Frons and vertex lustrous, minutely scabrous. Apex of frons raised into a carinate ridge which is medially sulcate and moderately upturned at ends. Frons distinctly sulcate along median line. Ocelli separated by less than width of an ocellus. Rostrum usually extending to apex of hind coxae. Antennae long, slender, third segment nearly cylindrical; length of antenna as compared to length of hind tibia :: 123 : 100 ♂, 120 : 100 ♀; length of second antennal segment as compared to width of head :: 72 : 100 ♂, 66 : 100 ♀. Antennal segmentation 1 : 2 : 3 : 4 :: 15 : 35 : 25 : 25 : ♂; 15 : 35 : 25: 25 ♀. Pronotum lustrous, minutely scabrous; median length of posterior lobe as compared to median length of anterior lobe : 80 : 100 ♂, 80 : 100 ♀. Anterior lobe strongly elevated, sulcus separating it from posterior lobe moderately incised; median fovea located at end of median third of anterior lobe, anterior lobe transversely depressed across median fovea. Posterior lobe narrowly explanate, lateral margins straight or slightly concavely curved, strongly convergent. Scutellum lustrous, minutely scabrous. Clavus opaque, remainder of hemelytron lustrous. Sutures of hemelytra distinct; corial veins obsolete; veins of membrane distinct, areoles forming an evenly gradate series. Posterior margin of last abdominal sternum of female evenly rounded; sternum moderately produced, approximately three times as long as preceding ster-

num. Clasper armed on inside of swollen portion with a short, ventrally directed tooth. Length of posterior tibia as compared to width of head :: 162 : 100 ♂; 155 : 100 ♀. Brachypterous forms are not known.

Comparative notes: Salda sectilis is closely related to **S. sulcata** (Barber) and **S. dentulata** new species, but is distinguished by the blending of the colors in the pattern of the hemelytra and the shape of the terminal processes of the genital capsule of the male. The evenly rounded apex of the genital capsule of the male and the tooth on the clasper will further distinguish this species from **S. sulcata.**

Location of types: Holotype, Red Tank, Canal Zone, April 14, 1923, R. C. Shannon, ♂; **allotype,** Red Tank, Canal Zone, April 14, 1923, R. C. Shannon, ♀; **paratypes, XX** Plantation, six miles east of Porto Bello, Panama, Feb. 19, 1930, T. O. Zschokke, 1 ♂; Paraiso, Canal Zone, Jan. 28, 1911, August Busck, 1 ♀.

The holotype is in the collections of United States National Museum, the allotype and female paratype are in the Francis Huntington Snow Entomological Collections, the male paratype is in the collections of the California Academy of Sciences.

Data on distribution: Known only from the type series.

Salda tepidaria n. sp.

Size: Length 4.81 mm. ♀. Width of pronotum 1.66 mm. ♀.

Color: General color black. Head black, with an orange spot on each side of ocelli; clypeus and labrum brown, labrum yellow on middle. Rostrum red-brown. First antennal segment red-brown, tipped with yellow; second, third and fourth segments red-brown. Eyes pale brown. Pronotum, scutellum and venter of thorax black. Hemelytra brown-black, with an obscure yellow spot on middle of corium before apex and at base of second areole; apical half of membrane paler than base. Sterna of abdomen dark brown, narrowly margined with yellow apically; last abdominal sternum of female dark brown basally, produced portion paler and narrowly margined with yellow-brown apically. Anterior coxae black basally, yellow apically; trochanters yellow; femora dark brown, paler basally and broadly tipped with yellow; tibiae yellow-brown, infuscated subbasally and tipped with brown; second tarsal segment yellow, third red-brown. Spines of legs black.

Structural characteristics: General shape oval. Clothed with fine, recumbent, golden pubescence beneath, on legs and on third and fourth antennal segments; anterior femora clothed with long, fine, erect, golden setae beneath; antennal segments with scattered, long, stiff, erect, dark setae; dorsal surfaces, excepting membrane, clothed with stiff, semi-erect dark setae, those of head longest. Width of head as compared to width of pronotum :: 75 : 100 ♀. Frons polished, minutely, transversely rugulose, distinctly sulcate between eyes along median line; apex of frons forming an obsolete carinate ridge between basal angles of clypeus and eyes. Vertex polished, obsoletely, minutely scabrous. Ocelli separated by less than the width of an ocellus. Rostrum extending to apex of hind coxae. Antennae moderately long, second, third and fourth segments moderately swollen, second tapering evenly from narrow base to broad apex, third and fourth fusiform. Length of antenna as compared to length of hind tibia :: 120 : 100 ♀; length of

second antennal segment as compared to width of head :: 62 : 100 ♀. Antennal segmentation 1 : 2 : 3 : 4 :: 16 : 31 : 24 : 29 ♀. Pronotum polished, posterior lobe obsoletely, transversely rugulose; median length of posterior lobe as compared to median length of anterior lobe :: 78 : 100 ♀. Anterior lobe moderately elevated, sulci before and behind it moderately incised and coarsely punctate, posterior sulcus slightly sinuated anteriorly in middle; median fovea located at end of anterior third of anterior lobe; anterior lobe transversely depressed across median fovea, obsoletely, punctately depressed on each side of median fovea. Posterior lobe distinctly explanate along lateral margins and narrowly explanate on each side of anterior lobe; lateral margins slightly concavely curved posteriorly. Scutellum polished, posterior half obsoletely, transversely rugulose. Clavus opaque, polished along commissure, remainder of hemelytron lustrous and (excepting membrane) minutely scabrous. Veins and sutures of hemelytra distinct. Areoles of membrane forming an evenly gradate series. Posterior margin of last abdominal sternum of female evenly rounded; sternum moderately produced, approximately two and one-half times as long as preceding sternum. Length of posterior tibia as compared to width of head :: 168 : 100 ♀. Known only from the female. Brachypterous forms are not known.

Comparative notes: S. tepidaria resembles **S. polita** Uhler but lacks the raised, carinate ridge at apex of frons and the dense golden pubescence on the pronotum and clavus. The long, erect setae of the second antennal segment, the differently shaped pronotum, the median sulcus of the frons and the polished head and pronotum will further distinguish **S. tepidaria** from **S. polita.** The swollen antennae will distinguish **S. tepidaria** from **S. laevis** Champion, **S. sulcicollis** Champion and **S. hispida** n. sp. which are similar in general facies and are found in the same area.

Location of type: Holotype, Real de Arriba, Temescaltepec, Mexico, May 23, 1933, H. E. Hinton and R. L. Usinger, ♀.

This specimen is in the collection of R. L. Usinger.

Data on distribution: Known only from the holotype.

Salda villosa n. sp.

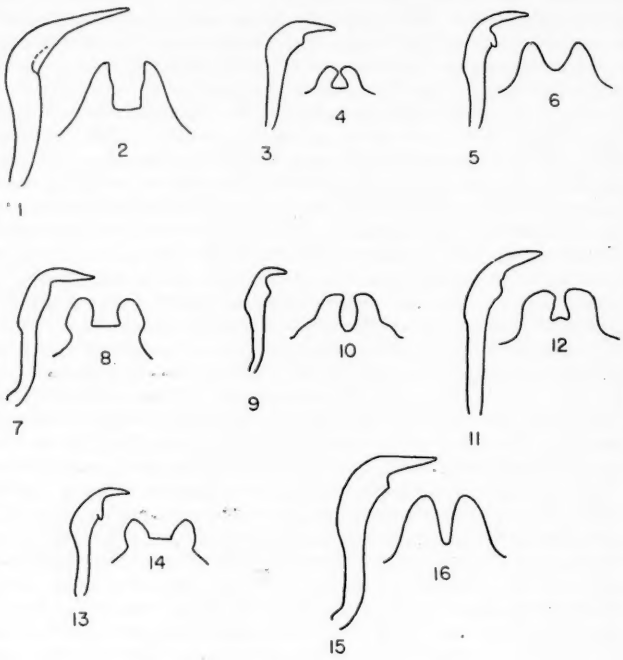
(Figures 15 and 16)

Size: (Brachypterous form): Length 3.75 to 4.13 mm. ♂; 4:20 mm. to 4.43 mm. ♀. Width of pronotum 150 mm. to 1.66 mm. ♂; 1.68 mm. to 1.76 mm. ♀. **(Macropterous form):** Length 4.20 mm. ♀. Width of pronotum 2.08 mm. ♀.

Color: General color black, marked with pruinose blue and yellow spots. Eyes pale brown to red-brown. Head black, with yellow spot on each side of ocelli; clypeus and labrum yellow; raised apex of frons yellow next to eyes. Rostrum yellow above, yellow-brown beneath. First antennal segment yellow, infuscated beneath and at apex; second, third and fourth antennal segments red-brown. Pronotum, scutellum and venter of thorax black; episternal plates before anterior and middle coxae narrowly margined with yellow. Clavus black, with a small, elongate, yellow spot near anterior end of commissure. Corium black, with a small pruinose blue spot on middle at end of basal fourth, a larger one on middle at end of basal half, and a still larger pruinose blue spot near claval suture before apex; largest pruinose

blue spot margined laterally with an elongate, yellow-white spot; another yellow-white spot is near lateral margin of corium at beginning of apical fourth; small yellow or white flecks are before apex at lateral margin and near middle. Embolium black, lateral third to half yellow-brown, excepting base, nodal furrow and a dark area at beginning of apical fourth; pruinose blue spots at end of basal third and before apex along inner margin and on middle at middle of length of embolium. Membrane dark brown, areoles variably spotted with yellow-white pruinose patches. In faded specimens pruinose spots of hemelytra are represented by yellow areas. Abdominal sterna dark brown, narrowly margined with yellow posteriorly; last abdominal sternum of female dark brown basally, produced portion yellow, margined with brown. Genital capsule of male dark brown. Coxae black basally, broadly yellow apically; trochanters yellow; femora yellow, variably spotted with brown; tibia yellow, infuscated at base and at tip, often ringed with yellow-brown on middle; tarsi yellow tipped with brown. Spines of legs black.

Structural characteristics: (Brachypterous form): General shape broadly oval. Clothed with golden pubescence and with a dense pile of long, stiff, erect setae on body, hemelytra, head, antennae and legs. Setae of hind tibiae shorter than those of head and hemelytra. Eyes clothed with stiff, erect, prominent setae. Width of head as compared to width of pronotum :: 76 : 100 ♂; 67 : 100 ♀. Frons polished, smooth; apex raised into a carinate ridge which is obsolete at middle and evenly curved toward eyes; frons convex, not medially sulcate between eyes. Ocelli separated by approximately the width of an ocellus. Rostrum usually extending to middle of hind coxae. Antennae long, slender, third segment fusiform; length of antenna as compared to length of hind tibia :: 115 : 100 ♂, 116 : 100 ♀. Antennal segmentation 1: 2 : 3 : 4 :: 17 : 34 : 24 : 25 ♂; 17 : 34 : 24 : 25 ♀. Pronotum polished, smooth; median length of posterior lobe as compared to median length of anterior lobe :: 49 : 100 ♂, 56 : 100 ♀. Anterior lobe moderately elevated, sulcus behind it moderately incised; median fovea located before middle of anterior lobe; anterior lobe deeply depressed on median line behind median fovea. Posterior lobe broadly explanate along lateral margins and on each side of anterior lobe; lateral margins convexly curved, strongly convergent. Scutellum polished, smooth; slightly convex, not swollen. Hemelytra opaque; lateral third to half of embolium polished; clavus polished along entire length of commissure; corium narrowly polished on anterior two-thirds along suture between embolium and corium; membrane lustrous. Sutures of hemelytra distinct; corial veins obsolete; veins of membrane distinct. Areoles of membrane forming an evenly gradate series, first areole slightly produced basally. Hind wings not visible beyond apex of abdomen. Posterior margin of last abdominal sternum of female rounded; sternum approximately two and one-half times as long as preceding sternum. Length of posterior tibia as compared to width of head :: 156 : 100 ♂; 161 : 100 ♀. **(Macropterous form):** General shape oval. Width of head as compared to width of pronotum :: 65 : 100 ♀; length of second antennal segment as compared to width of head :: 63 : 100 ♀. Antennal segmentation 1 : 2 : 3 : 4 :: 17 : 35 : 23 : 25 ♀. Median length of posterior lobe of pronotum as compared to median length of anterior lobe of pronotum :: 60 : 100 ♀. Mem-



EXPLANATION OF PLATE

1. **Pentacora signoretii yucatana.** Left clasper of male. Caudal aspect.
2. **Pentacora signoretii yucatana.** Terminal processes of male. Caudal aspect.
3. **Salda beameri.** Left clasper of male. Caudal aspect.
4. **Salda beameri.** Terminal processes of male. Caudal aspect.
5. **Salda dentulata.** Left clasper of male. Caudal aspect.
6. **Salda dentulata.** Terminal process of male. Caudal aspect.
7. **Salda dewsi.** Left clasper of male. Caudal aspect.
8. **Salda dewsi.** Terminal processes of male. Caudal aspect.
9. **Salda hungerfordi.** Left clasper of male. Caudal aspect.
10. **Salda hungerfordi.** Terminal processes of male. Caudal aspect.
11. **Salda laviniae.** Left clasper of male. Caudal aspect.
12. **Salda laviniae.** Terminal processes of male. Caudal aspect.
13. **Salda sectilis.** Left clasper of male. Caudal aspect.
14. **Salda sectilis.** Terminal processes of male. Caudal aspect.
15. **Salda villosa.** Left clasper of male. Caudal aspect.
16. **Salda villosa.** Terminal processes of male. Caudal aspect. All figures are X60.

brane normal, longer and broader than in brachypterous form. Hind wings reaching nearly to tip of hemelytra, readily visible beyond tip of abdomen. Length of hind tibia as compared to width of head :: 167 : 100 ♀. Identical with brachypterous form in other features.

Comparative notes: This species resembles **S. orbiculata** Uhler. **S. villosa** can be distinguished from **S. orbiculata** by the distinct deep depression of the anterior lobe of the pronotum behind the median fovea, by the color pattern of the hemelytra and by the longer hind tibia and second antennal segment, measured in comparison to the width of the head. These same features, in addition to the convexly curved lateral margins of the pronotum, will distinguish **S. villosa** from **S. severini** (Harris). **S. orbiculata** and **S. severini** lack the large pruinose blue spot on the corium next to the apex of the claval suture.

Location of types: Holotype, San Francisco County, California, September 14, 1908, E. C. Van Dyke, brachypterous male; **allotype,** San Francisco County, California, September 14, 1908, E. C. Van Dyke, brachypterous female; **paratypes,** Ingleside, California, December 20, 1920, Henry Dietrich, 2 brachypterous ♂♂, 1 brachypterous ♀ (Snow Collections); San Francisco County, California, September 14, 1908, E. C. Van Dyke, 2 brachypterous ♂♂, 4 brachypterous ♀♀ (Calif. Acad. Sci.); San Francisco County, California, August 16, 1908, E. C. Van Dyke, 2 brachypterous ♂♂, 1 brachypterous ♀ (Calif. Acad. Sci.); Sonoma County, California, 1 brachypterous ♂ (U. S. N. M.); **morphoholotype,** San Francisco County, California, September 14, 1908, E. C. Van Dyke, macropterous female.

The holotype and morphoholotype are in the Francis Huntington Snow Entomological Collections. The allotype is in the collections of the California Academy of Sciences. The paratypes are in the Snow Collections, California Academy of Sciences and the United States National Museum. The series of specimens from San Francisco County, California was determined as **Saldula orbiculata** (Uhler) by Van Duzee.

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